

حمل الآن

مجانا وحصريا

المراجعة رقم (1)

الترم الثاني





Second Term Questions Bank



Question 01

Complete the following sentences:

- 1 The reaction between acids and alkalis produces and
- 2 is formed from the combination of an alkaline cation with an anion
- 3 Salt is formed by the union of a metallic elemental ion with except for the hydroxide group.
- 4 The naming of a salt starts with the name and ends with the cation name
- 5 Copper sulfate salt is in color, while salt is white.
- 6 chloride dissolves in water, while chloride is sparingly soluble in water.
- 7 Sodium nitrate salt is composed of anion and cation.
- 8 salt is formed by the union of the calcium cation with the sulfate anion.
- 9 The salinity of the sea is about times that of the Red Sea
- 10 The molecular formula of bases that contain a cation Ca^{+2}
- 11 The total charge of molecules of any compound equals
- 12 The stomach secretes acid that helps in
- 13 All metals are solids except for which is a liquid.
- 14 All non-metal are solid materials such as, gaseous materials such as and the only liquid is
- 15 The atoms of solid metals are arranged in a structure known as



- 16 The metallic bond is formed due to the attraction between positiveof metal and the cloud of valence negativesurrounding it
- 17 The bronze alloy is composed ofat 5% andat 95%
- 18 The bronze alloy is used in manufacturingand_.....
- 19 The bronze alloy is characterized by being morethan copper andto rust
- 20 Each stage in which energy is transferred in the food chain is called
- 21 Carnivorous animals such asandare characterized by having sharp canines totheir prey.
- 22 Omnivorous animals such asandfeed on both meat &plants
- 23 Hyenas and vultures are considered, as they feed on the remains of dead organisms.
- 24 The molecular formula of the carbonate group iswhile the molecular formula of the sulphate group is
- 25 Oxygenated acids are those that containelement, such asand
- 26 Lemon and ketchup are consideredsubstances, while toothpaste and baking soda are consideredsubstances
- 27 When hydrochloric acid dissolves in water, it producesionion
- 28 When magnesium hydroxide dissolves in water, it formsion andion.
- 29 Acids react with alkalis to formand
- 30 Nitric acid is considered fromacids, while nitrous acid and sulfurous acid are considered fromacids.
- 31 Metals burn in the presence of oxygen gas forming, and most of them are known asoxides.
- 32 Non-metals burn the presence of oxygen gas forming, and most of them are known asoxides.
- 33 Distilled water has a neutral effect and does not change the color of litmus paper due to the equal number ofions with ions



- 34 There are many indicators, such as litmus paper and
- 35 The pH value of acids isthan 7, while inis greater than 7
- 36is the measuring unit of distance and displacement.
- 37andare the measuring units of speed.
- 38 Factors affecting the kinetic energy of the objectand
- 39 The measuring unit of kinetic energy is.....and is equal to
- 40 Kinetic energy of the object =
- 41 Kinetic energy isproportional to mass and
- 42 The more the mass of the object, thethe speed when the kinetic energy is constant
- 43 If the speed of the body increases into three times, its kinetic energy increases into times of its value.
- 44is the measuring unit of work while newton is the measuring unit of
- 45= Force \times Displacement
- 46 Factors affecting potential energy areand
- 47is the measuring unit of weight
- 48 Five kilometers =meters, while three kilojoules =joules
- 49 The ecosystem consists ofand
- 50 The rabbit and the horse are consideredbecause they havefor cutting plants.
- 51 Non-living components such asand
- 52 The ecosystem consists of several levels: the individual,, and



- 53is considered the basic unit in the classification of living organisms.
- 54is the individual that benefits from commensalism.
- 55is the one that is neither benefited nor harmed in commensalism relationship.
- 56 The pH value of a table salt solution (sodium chloride) is
- 57 The pH value is accurately measured by using
- 58 From neutral gases on litmus paper are and
- 59 The dissolution of sulphur trioxide (SO_3) in water forms
- 60 Dissolving ofin water forms magnesium hydroxide.
- 61 The combustion of fossil fuels produces oxides of and.....
- 62 Non-oxygenated acids don't containelement, such asand
- 63 Lactic acid provides the muscles withduring lacking of oxygen, and its accumulation in the muscles causes
- 64 Bromine is a liquid, while mercury is a liquid
- 65 Limestone is aRock, while marble is aRock
- 66 A change in the pH value of a solution from 7 to 12 means it wasand become
- 67 The freezing of water in rock crackes is one of the causes of theWeathering, while spherical weathering is a form of theweathering
- 68 The acid that contains ClO_2^- group has the molecular formulaand the alkali that contains NH_4^+ group has the molecular formula.....
- 69 The total length of any path taken by the object during its moving from the starting point to the end point is known asand its measuring unit is



-is the process of breaking and fragmenting rocks, while
 70is the transport of sediments from one location and their sedimentation in another.
- Large plants represent the organic origin offuel, while marine microorganisms represent the organic origin offuel.
 71
- Water exists in three states:, solid and
 72
- Water changes from the liquid state to thestate when it gains
 73
- Water changes from the gaseous state to the liquid state when it loses heat, in a process known as
 74
- Sources of water vapor in nature include, and ...
 75
- Thewater is stored beneath the Earth's surface.
 76
- The basic stages of the water cycle are, condensation,, surface runoff and
 77
- Each gene consists of smaller units called
 78
- Nucleotides exist in the form of.....twisted around each other, and the two strands are called
 79
- Each chromosome carries thousands or millions ofwhich vary in number from one chromosome to another in the cells of the same individual
 80
- The mixture used in separating strawberry chromosome consists ofandwith.....
 81
-is considered the founder of genetics, and he conducted his experiments on theplant
 82
- The scientistsandarrived at a working hypothesis for expressing genetic traits and called it
 83
- Genes produce, which is responsible for a chemical reaction that leads to the formation of, showing the genetic trait
 84



- 85 Spinal curvature is a result ofmutations, whileare a result of lethal mutations
- 86 The production of seedless lemons is a result ofmutations

Question 02

What is meant by

- 1 Atomic group
.....
- 2 Acidic oxides
.....
- 3 Indicators
.....
- 4 Distance
.....
- 5 Speed
.....
- 6 Energy
.....
- 7 Potential energy
.....
- 8 The independent variable
.....
- 9 The dependent variable
.....
- 10 Universal indicator
.....
- 11 Salts
.....
- 12 PH values
.....



13 Basic oxides

.....

14 Acid rain

.....

15 Acids

.....

16 Alkalis

.....

17 Movement path

.....

18 Displacement

.....

19 Work

.....

20 Potential energy

.....

21 The dependent variable

.....

22 The individual

.....

23 Bio community

.....

24 Competition

.....

25 Commensalism

.....

26 Food chain

.....

27 Ecosystem

.....



28 Predation

.....

29 Mutualism

.....

30 Food chain

.....

31 Biological control

.....

32 Energy pyramid

.....

33 Decomposers

.....

34 Food webs

.....

35 Controlled variables

.....

36 Kinetic energy

.....

37 Metallic bond

.....

38 Alloys

.....

39 Recycling

.....

40 Energy

.....

41 Rocks

.....

42 Transpiration process

.....



- 43 sediments
.....
- 44 Evaporation
.....
- 45 Boiling
.....
- 46 Condensation
.....
- 47 The water cycle
.....
- 48 Transpiration process
.....
- 49 The distance travelled by an object (50 meters)
.....
- 50 Displacement of a body (30 meters)
.....
- 51 Body speed (120 km/h)
.....
- 52 The kinetic energy of an object is 250 joules
.....
- 53 Potential energy of a body (60 J)
.....
- 54 Energy stored in the body as a result of work done (0.5 KJ)
.....
- 55 The mechanical energy of a moving object is 1000J
.....
- 56 Lemon is an acidic substance
.....



57 Nickel chloride is a salt

.....

58 Mutation

.....

59 Spontaneous mutation

.....

60 Induced mutation

.....

Question 03

Choose the correct answer

- 1 The electron configuration of the following elements ends with less than 4 electrons, except that of
☐ a hydrogen ☐ b sodium ☐ c phosphorus ☐ d magnesium
- 2 The object whose mass is 2 kg and its speed is 3 m/s has a kinetic energy equal
☐ a 6 J ☐ b 9 J ☐ c 6 KJ ☐ d 9 KJ
- 3 Bromine and mercury are similar in the
☐ a color ☐ b physical state ☐ c heat conductivity ☐ d boiling point
- 4 What is the common property in both copper and iron
☐ a color ☐ b Density ☐ c Melting point ☐ d Electrical conductivity
- 5 Bromine element is similar to graphite in the
☐ a Color ☐ b Physical state ☐ c Type of element ☐ d Electrical conductivity
- 6 If the speed of an object decreases to half while its mass remains constant, then its kinetic energy
☐ a decreases to half ☐ b decreases to a quarter ☐ c increases to 4 times ☐ d is doubled
- 7 All the following are properties of sodium element, except
☐ a a metal ☐ b has metallic luster ☐ c bad electrical conductor ☐ d formable
- 8 Which of the following is the correct arrangement of the hardness of sodium $_{11}\text{Na}$, magnesium $_{12}\text{Mg}$ and aluminum $_{13}\text{Al}$?
☐ a $\text{Na} > \text{Mg} > \text{Al}$ ☐ b $\text{Al} > \text{Mg} > \text{Na}$ ☐ c $\text{Mg} > \text{Na} > \text{Al}$ ☐ d $\text{Al} > \text{Na} > \text{Mg}$



- 9 Element (X) its boiling point is 2807°C and its melting point is 1064°C . Which of the following is a property of element (X)?
 (a) Bad electrical conductor (b) Brittle (c) Ductile (d) Opaque
- 10 Which of the following questions helps in the classification of some elements to metals and nonmetals?
 (a) Is it solid? (b) Is it liquid? (c) Is it coloured? (d) Is it brittle?
- 11 What is the common property of both sodium and copper?
 (a) Colour (b) Density (c) Melting point (d) Physical state
- 12 If the anion which composes the acid HClO is called hypochlorite, then the acid is called
 (a) hypochlorous acid (b) hypochloric acid (c) perchloric acid (d) chlorous acid
- 13 What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?
 (a) H^{+} (b) OH^{-} (c) Cl^{-} (d) Na^{+}
- 14 On dissolving calcium oxide in water, and placing two litmus strips in the solution, the colour of one of them changes into
 (a) red (b) purple (c) blue (d) yellow
- 15 All the following from ions that form salts, except
 (a) OH^{-} (b) Cl^{-} (c) NH_4^{+} (d) NO_3^{-}
- 16 In a food chain that includes insect, fish, plant and swan. Which of these living organisms is considered as a predator and a prey at the same time?
 (a) The insect (b) The fish (c) The plant (d) The swan
- 17 Millions of nucleotides come together directly, forming
 (a) chromosomes (b) chromatids (c) genes (d) histones
- 18 What are the two processes that occur at any temperature?
 (a) Melting and boiling (b) Evaporation and condensation (c) Melting and evaporation (d) Evaporation and boiling
- 19 The rock cycle is a model that illustrates
 (a) the unchanging of rocks (b) how magma is formed (c) how sediments are formed (d) transformations of rocks



- 20 The molecular formula of sulphuric acid is
- a H_2S b H_2SO_3 c H_3SO_3 d H_2SO_4
- 21 Human liver cells contain chromosomes
- a 20 b 23 c 32 d 46
- 22 The centromere connects between
- a two chromosomes b two chromatids c two genes d two nucleotides
- 23 The carbonate group differs from the sulphite group in
- a charge b number of atoms c number of elements d type of elements
- 24 The nutritional relationship between bear and fish is considered a
- a mutualism b competition c commensalism d predation
- 25 What is the acid that its accumulation in the muscles causes the muscle cramps?
- a Hydrochloric acid b Lactic acid c Acetic acid d Chlorous acid
- 26 The molecular formula of sulphurous acid is
- a H_2SO_3 b H_2S c H_2SO_4 d HSO_3
- 27 Among the basic gases
- a CO_2 b HCL c NH_3 d CH_4
- 28 What is the possible PH meter reading of dilute sodium hydroxide solution ?
- a 2 b 5 c 7 d 12
- 29 The nucleic acid DNA is wrapped around a type of protein known as
- a hormones b genes c histones d chromosomes
- 30 All the following physical quantities are measured in joules, except for
- a potential energy b force c work d kinetic energy
- 31 The conversion of gas into liquid represents the Process
- a boiling b condensation c evaporation d melting



- 32** What is the process that plants do in the water cycle?
 (a) photosynthesis (b) evaporation (c) transpiration (d) precipitation
- 33** The smallest building unit of DNA is
 (a) the gene (b) the chromosome (c) the nucleotide (d) the histone
- 34** The spider weaving its web is considered
 (a) a spontaneous mutation (b) an acquired trait (c) a genetic trait (d) an instinctive behaviour
- 35** The central point at which the two chromatids of the chromosome are connected is called
 (a) the nucleotide (b) the centrosome (c) the gene (d) the centromere
- 36** Which of the following rocks is formed from the lithification of sediments?
 (a) Quartzite (b) Pumice (c) Sandstone (d) Marble
- 37** Histones are
 (a) enzymes (b) proteins (c) fats (d) carbohydrates
- 38** The genetic material that found in cells and determine hereditary traits of the living organism called
 (a) PNA (b) NAD (c) AND (d) DNA
- 39** Which of the following rocks is used after being crushed to make casts
 (a) Gabbro (b) Limestone (c) Sandstone (d) Pumice
- 40** Genes control the appearance of hereditary traits in the living organism by producing
 (a) hormones (b) enzymes (c) chromosomes (d) vitamins

Question 04

Give one example of each of the following

- | | | |
|--|---|---|
| 1 Positive atomic group | (|) |
| 2 Gas that turns blue litmus paper into red | (|) |
| 3 Gas turns red litmus paper into blue | (|) |
| 4 White salts | (|) |
| 5 Coloured salts | (|) |
| 6 Salts dissolve in water | (|) |



- 7 Salts that are sparingly soluble in water ()
- 8 A gas that has a neutral effect on litmus paper ()
- 9 Chemical indicator that measures pH ()
- 10 Non-oxygenated acid that forms an anion in a liquid state . ()
- 11 Acid secreted by the stomach ()
- 12 Oxygenated acid carries three negative charges. ()
- 13 Acid secreted by muscles. ()
- 14 Weathering and erosion processes together. ()

Question 05

Cross out the odd word, then write the relation between the remaining words

- 1 Gold - Silver - Bromine – Mercury
.....
- 2 Phosphorus - Bromine - Mercury – Sulphur
.....
- 3 Graphite - Bromine - Phosphorus – Sulphur
.....
- 4 Iodine - Sulfur - Carbon – Hydrogen
.....
- 5 Bronze - Chlorine - Copper – Tin
.....
- 6 Universal indicator strips – litmus paper - voltameter – pH Meter
.....
- 7 N_2 – H_2O – H_2 – HCl
.....



- 8 $\text{HNO}_3 - \text{H}_2\text{SO}_4 - \text{H}_2\text{O} - \text{HCl}$
.....
- 9 Eggs – tomato – grapes – lemon
.....
- 10 Sodium chloride - Nickel chloride - Silver Chloride - Copper Sulphate
.....
- 11 $\text{H}_2\text{O} - \text{NaHCO}_3 - \text{CuSO}_4 - \text{AgNO}_3$
.....
- 12 Sodium chloride - Calcium chloride - Magnesium chloride - Silver nitrate
.....

Question 06

Give reason for each of the following

- 1 Calcium ($_{20}\text{Ca}$) is a metal while Chlorine ($_{17}\text{Cl}$) is a non-metal.
.....
- 2 Carbon is used in the manufacture of dry cells, although it is a non-metal.
.....
- 3 Acids turn blue litmus paper into red.
.....
- 4 Alkalis turn red litmus paper into blue.
.....
- 5 Litmus paper doesn't affect distilled water.
.....
- 6 Nitric acid turns blue litmus paper into red.
.....
- 7 Calcium hydroxide turns red litmus paper into blue.
.....



- 8 The work done by the car is less than the work done by the truck, even though their speeds are equal.
.....
- 9 The kinetic energy of the car decreases when the driver presses the car's brakes.
.....
- 10 Increasing the work required to stop a moving car at a high speed.
.....
- 11 Milk of Magnesia is used to treat stomach acidity.
.....
- 12 Sodium chloride salt is an ionic compound.
.....
- 13 Magnesium chloride salt consists of one magnesium cation and two chloride anions.
.....
- 14 You can't drown in the Dead Sea water.
.....
- 15 Bronze alloy is used in the manufacture of medals instead of copper.
.....
- 16 The difference of the evaporation process from the boiling process
.....
- 17 The relationship between bees and plant flowers is mutualism
.....
- 18 The electrical conductivity of acetic acid is less than the electric conductivity of hydrochloric acid
.....
- 19 The combustion (Burning) of fuel in a car is accompanied by a conversion of energy
.....



- 20 The curling up of hedgehog when it feels danger is classified as instinctive behaviour
.....
- 21 The sun and gravity together maintain the continuity of the water cycle in nature
.....
- 22 Not all salt solutions are neutral
.....
- 23 The difference in PH values of ammonium chloride from sodium chloride solutions
.....
- 24 The kinetic energy of a truck is greater than the kinetic energy of a car when their speeds are equal
.....
- 25 Hyenas are a scavengers
.....
- 26 The ladybug is used in biological control
.....
- 27 The water cycle in nature is a closed cycle
.....
- 28 The bow and arrow game is an example of energy conversion
.....
- 29 Fresh water consumption must be rationalized
.....
- 30 Water drops form on the outer surface of a cup containing water and ice Cubes
.....
- 31 The sun and gravity maintain the continuity of the water cycle
.....



32 Sea and ocean water are desalinated

.....

Question 07

What happens if

- 1 Knocking on a piece of graphite.
.....
- 2 Increasing the number of valence electrons in metal atoms according to the metallic bond.
.....
- 3 Dissolution of sulphur oxide in rain water
.....
- 4 Mixing molten gold with molten copper.
.....
- 5 Lack of food sources in a balanced ecosystem
.....
- 6 Food shortage for a group of hyenas
.....
- 7 The absence of one of the living organisms present in a balanced ecosystem.
.....
- 8 Increase in the number of primary consumers
.....
- 9 Decrease in the number of secondary consumers
.....
- 10 Placing potassium carbonate solution to water
.....



11 The speed of a moving object increases into the double with constant mass according to its kinetic energy.

.....

12 Mass doubled and velocity halved according to kinetic energy

.....

13 Two cars (1) and (2) move at different speeds and have the same mass according to kinetic energy.

.....

14 The passage of electric current through sulphuric acid and acetic acid according to lighting of the lamp

.....

15 Placing two red and blue litmus paper in a tube of hydrogen gas.

.....

16 Placing two red and blue litmus paper in a tube containing chlorine gas.

.....

17 Placing two red and blue litmus paper in a tube containing carbon dioxide gas.

.....

18 Placing two red and blue litmus paper in a tube containing ammonia gas.

.....

19 Adding calcium hydroxide to acidic soil

.....

20 Reaction of acids with alkalis

.....

21 A person who suffers from lactose intolerance eats milk chocolate

.....

22 Sulphuric acid dissolves in water

.....



Placing a cup of water in a sunny place for several hours

23

.....

Placing pieces of ice in a cup of water

24

.....

When the cloud temperature is below freezing point

25

.....

Question 08

Write the chemical formula for the following compounds:

- 1 Weak acid
- 2 Strong acid
- 3 Strong alkali
- 4 Weak alkali
- 5 Metallic oxide
- 6 Non-metallic oxide
- 7 Hydro sulphuric acid
- 8 Hydrobromic acid
- 9 Hydrochloric acid
- 10 Sulphuric acid
- 11 Sulphurous acid
- 12 Nitric acid
- 13 Nitrous acid
- 14 Potassium hydroxide
- 15 Atomic group consisting of three elements
- 16 Phosphoric acid
- 17 Ammonium hydroxide



Question 09

Write the names of the following chemical compounds and state their type:

- 1 H_2SO_4
- 2 SO_3
- 3 H_2CO_3
- 4 HCl
- 5 $Mg(OH)_2$
- 6 H_2S
- 7 H_3PO_4
- 8 N_2O
- 9 HNO_2
- 10 MgO

Question 10

Answer the following questions

- 1 How do you differentiate between Silver and Phosphorus in terms of Conductivity of electric current
.....
- 2 What is the benefit of Stomach acid
.....
- 3 What is the benefit of Lactic acid
.....
- 4 How to differentiate between Sulphurous acid and sulphuric acid in terms of molecular formula
.....
- 5 What is the benefit of Milk of Magnesia
.....
- 6 What is the benefit of Litmus paper
.....



7 How do you differentiate between nitric acid and nitrous acid?

.....

8 How to differentiate between (CO₂, O₂) gas

.....

9 Mention the type of food relationship between the remora fish that sticks to the shark's body and gets its food remains without affecting it on the shark.

.....

10 Mention the type of food relationship between the falcon that hunts mice.

.....

11 Mention the type of food relationship between the trees in the forest are densely packed together, blocking light from the short trees.

.....

12 Mention the type of food relationship between Spiders hunt insects

.....

13 Write the names of the elements that consists the bronze alloy

.....

14 Mention one use for Calcium carbonate powder

.....

15 Mention one importance for each of Bronze alloy

.....

16 Write the mathematical relation which represents the mechanical energy of a moving object

.....

17 Write the law expressing the relation between Speed and Distance

.....



18

Write the law expressing the relation between Speed and Kinetic energy

.....

19

What is the difference between Acquired traits and genetic traits

.....

20

What is the difference between Hydrogen chloride and hydrochloric acid

.....

21

Mention one importance for each of Genes

.....

22

State the importance of Water

.....

23

State the importance of the sun in the water cycle in nature

.....

24

State the importance of Gravity in the water cycle in nature

.....

Question 11

Problems

1

Calculate the speed of a body that covered a distance of 50 km in two hours.

.....

.....

2

Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s

.....

.....



- 3 A person pushed an object with a force of (40 Newtons) and it moved in a straight line a distance of (10 meters). Calculate the amount of work done.

.....

.....

- 4 Calculate the potential energy of a body with a mass of (15 kg) at a height of (150 cm), knowing that the acceleration due to gravity is (10 Newton/kg).

.....

.....

- 5 Calculate the kinetic energy of a ball with a mass of (20 kg) moving at a speed of (4 m/s).

.....

.....

- 6 Calculate the kinetic energy of a body weighing 20 Newton moving at a speed of 6 m/s.

.....

.....

- 7 Calculate the kinetic energy of a body with a mass of (500 g) that covers a distance of 20 meters in (4 seconds).

.....

.....

- 8 A body moves at a speed of 20 km/h. Calculate the distance travelled after three hours?

.....

.....

- 9 A body does work of (50 joules) to move a bicycle a distance of 10 meter Calculate the amount of force required to do the work.

.....

.....



10

A body with a potential energy of (240 joules) at a height of (12 meters)
Calculate the weight of the body.

.....

.....

11

Calculate the height of an object of mass is 6 kg above the ground when
its potential energy is 180 J, knowing that the gravitational field
intensity is 10 N/kg

.....

.....

انتهت الأسئلة مع أطيب الامنيات بالنجاح والتوفيق





Second Term Questions Bank



Question 01

Complete the following sentences:

- 1 The reaction between acids and alkalis produces salt and water
- 2 Salt is formed from the combination of an alkaline cation with an acid anion
- 3 Salt is formed by the union of a metallic elemental ion with atomic group except for the hydroxide group.
- 4 The naming of a salt starts with the alkali cation name and ends with the cation acid anion name
- 5 Copper sulfate salt is blue in color, while Sodium Carbonate (Na_2CO_3) salt is white.
- 6 Nickel chloride dissolves in water, while Silver chloride is sparingly soluble in water.
- 7 Sodium nitrate salt is composed of Nitrate anion and Sodium cation.
- 8 Calcium Sulphate (CaSO_4) salt is formed by the union of the calcium cation with the sulfate anion.
- 9 The salinity of the dead sea is about 10 times that of the Red Sea
- 10 The molecular formula of bases that contain a cation Ca^{+2} $\text{Ca}(\text{OH})_2$
- 11 The total charge of molecules of any compound equals Zero
- 12 The stomach secretes Hydrochloric acid that helps in food digestion
- 13 All metals are solids except for Mercury which is a liquid.
- 14 All non-metal are solid materials such as Carbon, gaseous materials such as Nitrogen and the only liquid is Bromine
- 15 The atoms of solid metals are arranged in a structure known as Crystal lattice



- 16 The metallic bond is formed due to the attraction between positive **ions** of metal and the cloud of valence negative **electrons** surrounding it
- 17 The bronze alloy is composed of **Tin** at 5% and **Copper** at 95%
- 18 The bronze alloy is used in manufacturing **Medals** and **Jewelry**
- 19 The bronze alloy is characterized by being more **hard** than copper and **resistant** to rust
- 20 Each stage in which energy is transferred in the food chain is called **trophic level**
- 21 Carnivorous animals such as **lion** and **snake** are characterized by having sharp canines to **tear** their prey.
- 22 Omnivorous animals such as **bear** and **mouse** feed on both meat & plants
- 23 Hyenas and vultures are considered **scavengers**, as they feed on the remains of dead organisms.
- 24 The molecular formula of the carbonate group is **CO₃**, while the molecular formula of the sulphate group is **SO₄**
- 25 Oxygenated acids are those that contain **Oxygen** element, such as **H₂SO₄** and **H₂CO₃**
- 26 Lemon and ketchup are considered **acidic** substances, while toothpaste and baking soda are considered **alkaline** substances
- 27 When hydrochloric acid dissolves in water, it produces **positive Hydrogen (H⁺)** ion and **negative chloride (Cl⁻)** ion
- 28 When magnesium hydroxide dissolves in water, it forms **positive magnesium** ion and **negative hydroxide** ion
- 29 Acids react with alkalis to form **salt** and **water**
- 30 Nitric acid is considered from **strong** acids, while nitrous acid and sulfurous acid are considered from **weak** acids.
- 31 Metals burn in the presence of oxygen gas forming **Metal oxides**, and most of them are known as **Basic** oxides.
- 32 Non-metals burn in the presence of oxygen gas forming **Non-metal Oxides**, and most of them are known as **Acidic** oxides.
- 33 Distilled water has a neutral effect and does not change the color of litmus paper due to the equal number of **H⁺** ions with **OH⁻** ions



- 34 There are many indicators, such as litmus paper and universal indicator
- 35 The pH value of acids is less than 7, while in bases is greater than 7
- 36 meter or kilometer is the measuring unit of distance and displacement.
- 37 km/h and m/s are the measuring units of speed.
- 38 Factors affecting the kinetic energy of the object mass and speed
- 39 The measuring unit of kinetic energy is Joule and is equal to kg x (m/s)²
- 40 Kinetic energy of the object = $\frac{1}{2} m \times v^2$
- 41 Kinetic energy is directly proportional to mass and square of speed
- 42 The more the mass of the object, the slower the speed when the kinetic energy is constant
- 43 If the speed of the body increases into three times, its kinetic energy increases into 9 times of its value.
- 44 joule is the measuring unit of work while newton is the measuring unit of force
- 45 Work = Force × Displacement
- 46 Factors affecting potential energy are weight and height
- 47 Newton is the measuring unit of weight
- 48 Five kilometers = 5000 meters, while three kilojoules = 3000 joules
- 49 The ecosystem consists of living organisms and non-living organisms
- 50 The rabbit and the horse are considered herbivores because they have incisors for cutting plants.
- 51 Non-living components such as air and water
- 52 The ecosystem consists of several levels: the individual, biotic population, and biological community



- 53 **Species** is considered the basic unit in the classification of living organisms.
- 54 **Commensal** is the individual that benefits from commensalism.
- 55 **Host** is the one that is neither benefited nor harmed in commensalism relationship.
- 56 The pH value of a table salt solution (sodium chloride) is **7**
- 57 The pH value is accurately measured by using **Ph meter**
- 58 From neutral gases on litmus paper are **H₂** and **O₂**
- 59 The dissolution of sulphur trioxide (SO₃) in water forms **Sulphuric acid H₂SO₄**
- 60 Dissolving of **Magnesium oxide (MgO)** in water forms magnesium hydroxide.
- 61 The combustion of fossil fuels produces oxides of **SO₂** and **NO₂**
- 62 Non-oxygenated acids don't contain **Oxygen** element, such as **Hydrochloric Acid (HCl)** and **Hydrobromic Acid (HBr)**
- 63 Lactic acid provides the muscles with **energy** during lacking of oxygen, and its accumulation in the muscles causes **muscle cramps**
- 64 Bromine is a liquid **nonmetal**, while mercury is a liquid **metal**
- 65 Limestone is a **sedimentary** Rock, while marble is a **metamorphic** Rock
- 66 A change in the pH value of a solution from 7 to 12 means it was **neutral** and become **alkaline**
- 67 The freezing of water in rock crackes is one of the causes of the **mechanical** Weathering, while spherical weathering is a form of the **chemical** weathering
- 68 The acid that contains ClO₂⁻ group has the molecular formula **HClO₂**, and the alkali that contains NH₄⁺ group has the molecular formula **NH₄OH**
- 69 The total length of any path taken by the object during its moving from the starting point to the end point is known as **distance** and its measuring unit is **Meter**
- 70 **weathering** is the process of breaking and fragmenting rocks, while **erosion** is the transport of sediments from one location and their sedimentation in another.



- 71 Large plants represent the organic origin of **coal** fuel, while marine microorganisms represent the organic origin of **petroleum oil** fuel.
- 72 Water exists in three states: **Liquid**, solid and **gas**
- 73 Water changes from the liquid state to the **gas** state when it gains **thermal energy**
- 74 Water changes from the gaseous state to the liquid state when it loses heat, in a process known as **condensation**
- 75 Sources of water vapor in nature include **water bodies**, **transpiration** and **sweat of human & animal**
- 76 The **ground** water is stored beneath the Earth's surface.
- 77 The basic stages of the water cycle are **evaporation**, condensation, **precipitation**, surface runoff and **infiltration**
- 78 Each gene consists of smaller units called **nucleotide**
- 79 Nucleotides exist in the form of **two strands** twisted around each other, and the two strands are called **double helix**
- 80 Each chromosome carries thousands or millions of **genes** which vary in number from one chromosome to another in the cells of the same individual
- 81 The mixture used in separating strawberry chromosome consists of **dishwashing liquid** and **table salt** with **water**
- 82 **Mendel** is considered the founder of genetics, and he conducted his experiments on the **pea** plant
- 83 The scientists **Beadle** and **Tatum** arrived at a working hypothesis for expressing genetic traits and called it **one gene – one enzyme**
- 84 Genes produce **enzyme**, which is responsible for a chemical reaction that leads to the formation of **protein**, showing the genetic trait
- 85 Spinal curvature is a result of **harmful** mutations, while **muscular dystrophy** are a result of lethal mutations
- 86 The production of seedless lemons is a result of **beneficial** mutations



Question 02

What is meant by

- 1 **Atomic group**
An ion composed of more than one atom of more than one element
- 2 **Acidic oxides**
They are non-metal oxides, that dissolve in water forming acids
- 3 **Indicators**
The are chemical substances whose color differs in the acidic medium from the alkaline medium.
- 4 **Distance**
The total lengths of any path taken by the object during its moving from the starting point to the end point
- 5 **Speed**
The distance covered per unit of time
- 6 **Energy**
It is the ability to do work
- 7 **Potential energy**
It is the stored energy in the object, as a result of the work done on it
- 8 **The independent variable**
The variable that is a changed during the experiment
- 9 **The dependent variable**
The variable to be tested which changes in response to changing the independent variable
- 10 **Universal indicator**
It is a chemical indicator that can be used to distinguish between acids and alkalis, acids and each other, or alkalis and each other according to their strength
- 11 **Salts**
Salts are ionic compounds formed due to reaction between alkalis and acids.



12 PH values

Potential of hydrogen is a scale ranging from 0 to 14 that indicates the acidity of basicity of a solution

13 Basic oxides

They are metals oxides, that dissolve in water forming alkalis

14 Acid rain

They are rain resulting from the dissolution of acidic oxides in the water vapor of the atmosphere

15 Acids

Substances that dissolve in water and give positive hydrogen ions H^+

16 Alkalis

Substances that dissolve in water and give negative hydroxide ions OH^-

17 Movement path

A set of points that an object passes through during its motion

18 Displacement

It is the shortest straight path connecting the starting point and the end point in constant direction

19 Work

The amount of energy required to move an object through a certain displacement is the same direction of the force which acts on it

20 Potential energy

It is the stored energy in an object as a result of the work done on it

21 The dependent variable

The variable to be tested which changes in response to changing the independent variable

22 The individual

It is a single living organism that belongs to a specific species.

23 Bio community

It includes the various populations of different species that inhabit the same environment

Competition



- 24** It is a nutritional relationship between two individuals of the same species for a food source that is found in limited quantities which negative impacts their growth or survival
- 25** **Commensalism**
It is a nutritional relationship between two individuals that benefits one organism, known as the commensal, while the other organisms known as a host neither benefits nor is harmed
- 26** **Food chain**
It is the path of energy transfer in the form of food as it moves from one living organisms to another within ecosystem
- 27** **Ecosystem**
It is an area that consists of living organisms and non-living components.
- 28** **Predation**
It is a nutritional relationship between two living organisms, one benefit (predator) and the other harmed (prey)
- 29** **Mutualism**
It is a food relationship between two individuals, both of them benefits from each other without causing harm to either of them
- 30** **Food chain**
It is the path of energy transfer in the form of food as it moves from one living organisms to another within ecosystem
- 31** **Biological control**
It is a food system that uses (utilizes) living organisms to eliminate agriculture pests instead of using pesticides
- 32** **Energy pyramid**
It is a pyramid that represents the flow of energy and the amount of energy at each trophic levels in a food chain.
- 33** **Decomposers**
They are living organisms that obtain their food from the dead bodies.
- 34** **Food webs**
It is the interconnection and overlapping of multiple food chains.

Controlled variables



- 35** The variables that are controlled to remain constant throughout the experiment.
- 36** Kinetic energy
It is the gained energy by an object as a result of its motion
- 37** Metallic bond
It is the attraction force between the positive metal ions and the negative valence electron cloud which surrounds them
- 38** Alloys
It is a mixture composed of the metals of two or more metals
- 39** Recycling
It is process of the conversion of the wastes into new usable substance
- 40** Energy
The ability to do work
- 41** Rocks
Solid materials composed of one or several minerals
- 42** Transpiration process
The process through which a plant loses water in form of water vapor
- 43** sediments
Particles of rock fragments transported away from the area where weathering occurred
- 44** Evaporation
Conversion of water from liquid state to gas state by gaining heat, occur at any temperature
- 45** Boiling
Conversion of water from liquid state to gas state by gaining heat, occur at certain temperature (100°C)
- 46** Condensation
Conversion of water from gas state to liquid state by losing heat, occur at any temperature.



- 47** The water cycle
Natural process, that show movement of water between the atmospheric air and earth in closed-multi path cycle
- 48** Transpiration process
Process by which plants lose water in form water vapor
- 49** The distance travelled by an object (50 meters)
This means the total length of any path taken by this object during its moving from starting point to the end point = 50 meters
- 50** Displacement of a body (30 meters)
This means that the length of the shortest straight path connecting between starting and the end point in a constant direction = 30 meters
- 51** Body speed (120 km/h)
This means that this body covers a distance of 120 km in one hour
- 52** The kinetic energy of an object is 250 joules
It is the gained energy by an object as a result of its motion equals 250 joules
- 53** Potential energy of a body (60 J)
This means that the energy stored in the body as a result of work done = 60 J
- 54** Energy stored in the body as a result of work done (0.5 KJ)
This means the potential energy = 0.5KJ
- 55** The mechanical energy of a moving object is 1000J
The summation of the potential and the kinetic energies of this object equals 1000J
- 56** Lemon is an acidic substance
Its PH is less than 7
- 57** Nickel chloride is a salt
It is formed from the combination of a cation of an alkali (Ni^{2+}) with an anion of an acid (Cl^-)
- 58** Mutation
Emergence of new hereditary trait that doesn't appear before, as a result of change in the gene



59 Spontaneous mutation

Mutation that occurs naturally, without human intervention

60 Induced mutation

Mutation that is made by human intervention

Question 03

Choose the correct answer

- 1 The electron configuration of the following elements ends with less than 4 electrons, except that of
 (a) hydrogen (b) sodium (c) **phosphorus** (d) magnesium
- 2 The object whose mass is 2 kg and its speed is 3 m/s has a kinetic energy equal
 (a) 6 J (b) **9 J** (c) 6 KJ (d) 9 KJ
- 3 Bromine and mercury are similar in the
 (a) **color** (b) physical state (c) heat conductivity (d) boiling point
- 4 What is the common property in both copper and iron
 (a) color (b) Density (c) Melting point (d) **Electrical conductivity**
- 5 Bromine element is similar to graphite in the
 (a) Color (b) Physical state (c) **Type of element** (d) Electrical conductivity
- 6 If the speed of an object decreases to half while its mass remains constant, then its kinetic energy
 (a) decreases to half (b) **decreases to a quarter** (c) increases to 4 times (d) is doubled
- 7 All the following are properties of sodium element, except
 (a) a metal (b) has metallic luster (c) **bad electrical conductor** (d) formable
- 8 Which of the following is the correct arrangement of the hardness of sodium $_{11}\text{Na}$, magnesium $_{12}\text{Mg}$ and aluminum $_{13}\text{Al}$?
 (a) $\text{Na} > \text{Mg} > \text{Al}$ (b) **$\text{Al} > \text{Mg} > \text{Na}$** (c) $\text{Mg} > \text{Na} > \text{Al}$ (d) $\text{Al} > \text{Na} > \text{Mg}$
- 9 Element (X) its boiling point is 2807°C and its melting point is 1064°C Which of the following is a property of element (X)?
 (a) Bad electrical conductor (b) Brittle (c) **Ductile** (d) Opaque



- 10 Which of the following questions helps in the classification of some elements to metals and nonmetals?
 (a) Is it solid? (b) Is it liquid? (c) Is it coloured? (d) Is it brittle?
- 11 What is the common property of both sodium and copper?
 (a) Colour (b) Density (c) Melting point (d) Physical state
- 12 If the anion which composes the acid HClO is called hypochlorite, then the acid is called
 (a) hypochlorous acid (b) hypochloric acid (c) perchloric acid (d) chlorous acid
- 13 What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?
 (a) H⁺ (b) OH⁻ (c) Cl⁻ (d) Na⁺
- 14 On dissolving calcium oxide in water, and placing two litmus strips in the solution, the colour of one of them changes into
 (a) red (b) purple (c) blue (d) yellow
- 15 All the following from ions that form salts, except
 (a) OH⁻ (b) Cl⁻ (c) NH₄⁺ (d) NO₃⁻
- 16 In a food chain that includes insect, fish, plant and swan. Which of these living organisms is considered as a predator and a prey at the same time?
 (a) The insect (b) The fish (c) The plant (d) The swan
- 17 Millions of nucleotides come together directly, forming
 (a) chromosome (b) chromatids (c) genes (d) histones
- 18 What are the two processes that occur at any temperature?
 (a) Melting and boiling (b) Evaporation and condensation (c) Melting and evaporation (d) Evaporation and boiling
- 19 The rock cycle is a model that illustrates
 (a) the unchanging of rocks (b) how magma is formed (c) how sediments are formed (d) transformations of rocks
- 20 The molecular formula of sulphuric acid is
 (a) H₂S (b) H₂SO₃ (c) H₃SO₃ (d) H₂SO₄



- 21 Human liver cells contain chromosomes
 (a) 20 (b) 23 (c) 32 (d) **46**
- 22 The centromere connects between
 (a) two chromosome
s (b) **two chromatids** (c) two genes (d) two nucleotides
- 23 The carbonate group differs from the sulphite group in
 (a) charge (b) number of atoms (c) number of elements (d) **type of elements**
- 24 The nutritional relationship between bear and fish is considered a
 (a) mutualism (b) competition (c) commensalism (d) **predation**
- 25 What is the acid that its accumulation in the muscles causes the muscle cramps?
 (a) Hydrochloric acid (b) **Lactic acid** (c) Acetic acid (d) Chlorous acid
- 26 The molecular formula of sulphurous acid is
 (a) **H₂SO₃** (b) H₂S (c) H₂SO₄ (d) HSO₃
- 27 Among the basic gases
 (a) **CO₂** (b) HCL (c) NH₃ (d) CH₄
- 28 What is the possible PH meter reading of dilute sodium hydroxide solution ?
 (a) 2 (b) 5 (c) 7 (d) **12**
- 29 The nucleic acid DNA is wrapped around a type of protein known as
 (a) hormones (b) genes (c) histones (d) **chromosomes**
- 30 All the following physical quantities are measured in joules, except for
 (a) potential energy (b) **force** (c) work (d) kinetic energy
- 31 The conversion of gas into liquid represents the Process
 (a) boiling (b) **condensation** (c) evaporation (d) melting
- 32 What is the process that plants do in the water cycle?
 (a) photosynthesis (b) evaporation (c) **transpiration** (d) precipitation



- 33 The smallest building unit of DNA is
- a the gene b the chromosome c the nucleotide d the histone
- 34 The spider weaving its web is considered
- a a spontaneous mutation b an acquired trait c a genetic trait d an instinctive behaviour
- 35 The central point at which the two chromatids of the chromosome are connected is called
- a the nucleotide b the centrosome c the gene d the centromere
- 36 Which of the following rocks is formed from the lithification of sediments?
- a Quartzite b Pumice c Sandstone d Marble
- 37 Histones are
- a enzymes b proteins c fats d carbohydrates
- 38 The genetic material that found in cells and determine hereditary traits of the living organism called
- a PNA b NAD c AND d DNA
- 39 Which of the following rocks is used after being crushed to make casts
- a Gabbro b Limestone c Sandstone d Pumice
- 40 Genes control the appearance of hereditary traits in the living organism by producing
- a hormones b enzymes c chromosomes d vitamins

Question 04

Give one example of each of the following

- | | |
|---|--|
| 1 Positive atomic group | (NH ₄ ⁺) |
| 2 Gas that turns blue litmus paper into red | Carbon dioxide |
| 3 Gas turns red litmus paper into blue | Ammonia gas |
| 4 White salts | Sodium carbonate NaCO ₃ |
| 5 Coloured salts | Copper Sulphate CuSO ₄ (blue) |
| 6 Salts dissolve in water | Copper sulphate (CuSO ₄) |
| 7 Salts that are sparingly soluble in water | Calcium Sulphate CaSO ₄ |
| 8 A gas that has a neutral effect on litmus paper | Hydrogen |



- 9 Chemical indicator that measures pH
- 10 Non-oxygenated acid that forms an anion in a liquid state
- 11 Acid secreted by the stomach
- 12 Oxygenated acid carries three negative charges.
- 13 Acid secreted by muscles
- 14 Weathering and erosion processes together

Universal indicator

Hydrochloric Acid (HCl)

Hydrochloric Acid (HCl)

Phosphoric Acid (H_3PO_4)

Lactic Acid

The formation of the agricultural soil over millions of years in Egypt

Question 05

Cross out the odd word, then write the relation between the remaining words

- 1 Gold - Silver - Bromine – Mercury
bromine → (Metallic Elements)
- 2 Phosphorus - Bromine - Mercury – Sulphur
Mercury → (Non-Metallic Elements)
- 3 Graphite - Bromine - Phosphorus – Sulphur
Graphite → (Bad Electric Conductors)
- 4 Iodine - Sulfur - Carbon – Hydrogen
Hydrogen → (Solid Nonmetallic Elements)
- 5 Bronze - Chlorine - Copper – Tin
Chlorine → (Alloy and its components)
- 6 Universal indicator strips – litmus paper - voltameter – pH Meter
Voltameter → (the remaining words are chemical indicator)
- 7 N_2 – H_2O – H_2 – HCl
HCl → (the remaining has a neutral effect on litmus paper)
- 8 HNO_3 – H_2SO_4 – H_2O – HCl
 H_2O → (are remaining words are acids)



- 9 Eggs – tomato – grapes – lemon
Egg → (the remaining words are acidic substances)
- 10 Sodium chloride - Nickel chloride - Silver Chloride - Copper Sulphate
Silver Chloride → (The remaining are salts dissolved in water)
- 11 H_2O - $NaHCO_3$ - $CuSO_4$ - $AgNO_3$
 H_2O → (The remaining are salts)
- 12 Sodium chloride - Calcium chloride - Magnesium chloride - Silver nitrate
Silver nitrate → (All remaining are salts contain chloride anion)

Question 06

Give reason for each of the following

- 1 Calcium ($_{20}Ca$) is a metal while Chlorine ($_{17}Cl$) is a non-metal.
Calcium Ca 20 2,8,8,2 is a metal because it has 2 electrons in the outermost energy level
Chlorine Cl 17 2,8,8,7 is a non-metal because it has 7 electrons in its outermost energy level
- 2 Carbon is used in the manufacture of dry cells, although it is a non-metal.
Because Carbon is good conductor of electricity.
- 3 Acids turn blue litmus paper into red.
Because acids dissolve in water, forming hydrogen cation H^+
- 4 Alkalis turn red litmus paper into blue.
Because alkali dissolve water, forming hydroxide anion OH^-
- 5 Litmus paper doesn't affect distilled water.
Because distilled water is neutral solution (number of cations of H^+ equal to number of anions of OH^-)
- 6 Nitric acid turns blue litmus paper into red.
Due to the presence of hydrogen cations (H^+)



- 7 Calcium hydroxide turns red litmus paper into blue.
Due to the presence of hydroxide anions (OH^-)
- 8 The work done by the car is less than the work done by the truck, even though their speeds are equal.
Because the mass of truck is greater than the mass of car
- 9 The kinetic energy of the car decreases when the driver presses the car's brakes.
Because when the driver presses cars breaks, the speed of car will decrease and its kinetic energy decrease
- 10 Increasing the work required to stop a moving car at a high speed.
Because the car which moves at high speed has large kinetic energy.
- 11 Milk of Magnesia is used to treat stomach acidity.
To neutralize the gastric acidity, as it contains $\text{Mg}(\text{OH})_2$
- 12 Sodium chloride salt is an ionic compound.
Because it is produced from reaction between alkali (sodium cation) and acid (chloride anion)
- 13 Magnesium chloride salt consists of one magnesium cation and two chloride anions.
Because the total charge of molecules of any compound equal zero and the chloride anion carries one negative charge while the magnesium cation carries two positive charges
- 14 You can't drown in the Dead Sea water.
Due to the high percentage of the salt in water this leads to an increase in water density
- 15 Bronze alloy is used in the manufacture of medals instead of copper.
Because bronze alloy is harder than copper and resistant to rusting
- 16 The difference of the evaporation process from the boiling process
Because the evaporation process occurs at any temperature, while the boiling process occurs at a specific temperature



- 17** The relationship between bees and plant flowers is mutualism
Because bees benefit by extracting nectar from flowers and plants benefit from transferring of their pollen grains on the bodies of bees from one flower to another, which promotes the floral reproduction
- 18** The electrical conductivity of acetic acid is less than the electric conductivity of hydrochloric acid
Because acetic acid is a weak acid, while hydrochloric acid is a strong acid
- 19** The combustion (Burning) of fuel in a car is accompanied by a conversion of energy
Because when fuel burns (a chemical reaction occurs), the potential energy stored in the chemical bonds of the fuel is converted into kinetic energy
- 20** The curling up of hedgehog when it feels danger is classified as instinctive behaviour
Because it is a behavior that is transmitted from parents to offspring without learning
- 21** The sun and gravity together maintain the continuity of the water cycle in nature
Because the heat of the sun causes water to move from the Earth to the atmospheric air during the evaporation process, while the gravitational force works to return the water back to the Earth again during the precipitation process
- 22** Not all salt solutions are neutral
Because there are acidic salt solutions such as ammonium chloride solution and others that are alkaline such as sodium carbonate solution
- 23** The difference in PH values of ammonium chloride from sodium chloride solutions
Because ammonium chloride solution is acidic (its PH value is less than 7), while sodium chloride solution is neutral (its PH value equals 7)
- 24** The kinetic energy of a truck is greater than the kinetic energy of a car when their speeds are equal
Because the mass of the truck is greater than the mass of the car and kinetic energy increases with increasing the mass of the object



- 25** Hyenas are a scavengers
Because it feeds on the remains of dead organisms
The ladybug is used in biological control
- 26** Because it used to feed on aphid insects which are agricultural pests that harm vegetables and fruits
The water cycle in nature is a closed cycle
- 27** Because sun cause water evaporation into water vapour then condenses forming clouds then it precipitate and return to earth due to gravity.
The bow and arrow game is an example of energy conversion
- 28** Because when the arrow is drawn, it stores potential energy, and upon release, the stored potential energy is converted into kinetic energy
- 29** Fresh water consumption must be rationalized
To ensure sustainability of fresh water in future
- 30** Water drops form on the outer surface of a cup containing water and ice Cubes
Due to condensation of water vapor in air, forming water droplets on cup outer surface
- 31** The sun and gravity maintain the continuity of the water cycle
Sun causes water to move from earth to atmospheric air (evaporation)
Gravity causes water to return to earth (precipitation)
- 32** Sea and ocean water are desalinated
To face shortage of fresh water suitable for drinking, irrigation and agriculture

Question 07

What happens if

- 1** Knocking on a piece of graphite.
The piece of graphite crumbles easily, because graphite is a brittle nonmetal (not malleable)



- 2 Increasing the number of valence electrons in metal atoms according to the metallic bond.
The metallic bond strength increases
- 3 Dissolution of sulphur oxide in rain water
Formation of sulphuric acid H_2SO_4 which cause acid rain
- 4 Mixing molten gold with molten copper.
Alloy is formed
- 5 Lack of food sources in a balanced ecosystem
The competition happens between individuals of the same species which negatively impacts their growth or survival.
- 6 Food shortage for a group of hyenas
The competition happens between them which negatively impacts their growth or survival.
- 7 The absence of one of the living organisms present in a balanced ecosystem.
The other living organisms in the food chain or the food web are affected, it causes an imbalance for the ecosystem
- 8 Increase in the number of primary consumers
The number of producers decreases.
The number of secondary consumers increases
Decrease in the number of secondary consumers
- 9 **The number of primary consumers increases.**
The number of tertiary consumers decreases.
- 10 Placing potassium carbonate solution to water
The potassium carbonate dissolved in water and release potassium cation K^+ and carbonate anion CO_3^{2-}
- 11 The speed of a moving object increases into the double with constant mass according to its kinetic energy.
The kinetic energy increased to 4 times its value



- 12** Mass doubled and velocity halved according to kinetic energy
Kinetic energy decreased to half its value
- 13** Two cars (1) and (2) move at different speeds and have the same mass according to kinetic energy.
Kinetic energy has different value because they have different speed
- 14** The passage of electric current through sulphuric acid and acetic acid according to lighting of the lamp
Sulphuric acid is strong acid so the light of lamp will be strong, while acetic acid is weak acid so the light of the lamp will be weak
- 15** Placing two red and blue litmus paper in a tube of hydrogen gas.
The colour of litmus paper doesn't change
- 16** Placing two red and blue litmus paper in a tube containing chlorine gas.
It removes the color of wet litmus paper
- 17** Placing two red and blue litmus paper in a tube containing carbon dioxide gas.
It changes the colour of wet litmus paper will be red
- 18** Placing two red and blue litmus paper in a tube containing ammonia gas.
It changes the colour of wet litmus paper will be blue
- 19** Adding calcium hydroxide to acidic soil
Calcium hydroxide treats the acidic soil
- 20** Reaction of acids with alkalis
Formation of salt and water
- 21** A person who suffers from lactose intolerance eats milk chocolate
This person feels crampy and suffers from nausea and other painful symptoms



- 22** Sulphuric acid dissolves in water
The percentage of H^+ cation increases in the solution
Placing a cup of water in a sunny place for several hours
- 23** Evaporation of water into water vapor
Placing pieces of ice in a cup of water
- 24** Forming of water droplet outside the cup
When the cloud temperature is below freezing point
- 25** Snow precipitate instead rain

Question 08

Write the chemical formula for the following compounds:

- | | |
|---|---------------------------------|
| 1 Weak acid | Nitrous acid (HNO_2) |
| 2 Strong acid | Hydrochloric acid (HCl) |
| 3 Strong alkali | Sodium Hydroxide ($NaOH$) |
| 4 Weak alkali | Ammonium hydroxide (NH_4OH) |
| 5 Metallic oxide | Magnesium oxide (MgO) |
| 6 Non-metallic oxide | Sulphur trioxide (SO_3) |
| 7 Hydro sulphuric acid | H_2S |
| 8 Hydrobromic acid | HBr |
| 9 Hydrochloric acid | HCl |
| 10 Sulphuric acid | H_2SO_4 |
| 11 Sulphurous acid | H_2SO_3 |
| 12 Nitric acid | HNO_3 |
| 13 Nitrous acid | HNO_2 |
| 14 Potassium hydroxide | KOH |
| 15 Atomic group consisting of three elements | HCO_3 |
| 16 Phosphoric acid | H_3PO_4 |
| 17 Ammonium hydroxide | NH_4OH |



Question 09

Write the names of the following chemical compounds and state their type:

- 1 H_2SO_4 Sulphuric acid → (acid)
- 2 SO_3 Sulphite group → (Atomic group)
- 3 H_2CO_3 Carbonic acid → (oxyacid)
- 4 HCl hydrochloric acid → (acid don't contain oxygen)
- 5 $Mg(OH)_2$ Magnesium hydroxide → alkaline
- 6 H_2S hydro sulphuric acid → acid don't Contain oxygen.
- 7 H_3PO_4 Phosphoric acid → oxoacids
- 8 N_2O Nitrous oxide → (oxide)
- 9 HNO_2 Nitrous acid → (oxyacid)
- 10 MgO magnesium oxide → (basic oxide)

Question 10

Answer the following questions

- 1 How do you differentiate between Silver and Phosphorus in terms of Conductivity of electric current
Silver is good conductor of electricity -Phosphorus is a bad conductor of electricity
- 2 What is the benefit of Stomach acid
Participate in Food digestion.
- 3 What is the benefit of Lactic acid
it provides the muscle with oxygen, when oxygen is lacking.
- 4 How to differentiate between Sulphurous acid and sulphuric acid in terms of molecular formula
Sulphurous acid → H_2SO_3
Sulphuric acid → H_2SO_4
- 5 What is the benefit of Milk of Magnesia
To neutralize gastric acidity as it contains magnesium hydroxide(Magnesium, Oxygen and Hydrogen)



6 What is the benefit of Litmus paper

To differentiate between acids and alkali as acids turn litmus paper into red, while alkali turns litmus paper into blue

7 How do you differentiate between nitric acid and nitrous acid?

Nitric acid is strong acid – Nitrous acid is weak acid by measuring the Ph value by Ph meter device Nitric acid will have small Ph value.

- Nitrous acid bad conductor of electricity – nitric acid is good conductor of electricity

8 How to differentiate between (CO_2 , O_2) gas

By wet litmus paper; CO_2 Changes it into red- O_2 doesn't change its colour

9 Mention the type of food relationship between the remora fish that sticks to the shark's body and gets its food remains without affecting it on the shark.

Commensalism

10 Mention the type of food relationship between the falcon that hunts mice.

Predation

11 Mention the type of food relationship between the trees in the forest are densely packed together, blocking light from the short trees.

Competition

12 Mention the type of food relationship between Spiders hunt insects

Predation

13 Write the names of the elements that consists the bronze alloy

Copper and tin

14 Mention one use for Calcium carbonate powder

Used in making the casts used for patients with bone fractures

15 Mention one importance for each of Bronze alloy

Used in jewelry



16

Write the mathematical relation which represents the mechanical energy of a moving object

$$ME = KE + PE$$

17

Write the low expressing the relation between Speed and Distance

$$v = \frac{d}{t}$$

18

Write the low expressing the relation between Speed and Kinetic energy

$$KE = \frac{1}{2}mv^2$$

19

What is the difference between Acquired traits and genetic traits

Acquired traits: Traits that are not inherited from parents to offspring but are acquired from the surrounding environment through learning or training, they are not transmitted from one generation to another

Genetic traits: Traits that are transmitted from parents to offspring without learning, and are inherited from one generation to the next

20

What is the difference between Hydrogen chloride and hydrochloric acid

Hydrogen chloride: HCl compound in the gaseous state

Hydrochloric acid: HCl compound in the form of a solution (acid)

21

Mention one importance for each of Genes

Responsible for expressing the hereditary traits in living organisms

22

State the importance of Water

Drinking – agricultural – sanitation - hygiene

State the importance of the sun in the water cycle in nature

23

The sun causes water to evaporate from earth to atmosphere air

State the importance of Gravity in the water cycle in nature

24

It causes water to return back to earth through precipitation process



Question 11

Problems

- 1 Calculate the speed of a body that covered a distance of 50 km in two hours.
 $d = 50 \text{ km}$ $t = 2 \text{ h}$ $v = ?$

$$v = \frac{d}{t} = \frac{50}{2} = 25 \text{ km/h}$$
- 2 Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s
 $d = 300 \text{ m}$ $v = 20 \text{ m/s}$ $t = ?$

$$t = \frac{d}{v} = \frac{300}{20} = 15 \text{ sec}$$
- 3 A person pushed an object with a force of (40 Newtons) and it moved in a straight line a distance of (10 meters). Calculate the amount of work done.
 $F = 40 \text{ N}$ $S = 10 \text{ m}$ $W = ?$

$$W = F \times S = 40 \times 10 = 400 \text{ J}$$
- 4 Calculate the potential energy of a body with a mass of (15 kg) at a height of (150 cm), knowing that the acceleration due to gravity is (10 Newton/kg).
 $PE = ?$ $m = 15 \text{ kg}$ $g = 10 \text{ N/kg}$ $h = \frac{150}{100} = 1.5 \text{ m}$

$$PE = m \times g \times h$$

$$= 15 \times 10 \times 1.5 = 225 \text{ J}$$
- 5 Calculate the kinetic energy of a ball with a mass of (20 kg) moving at a speed of (4 m/s).
 $m = 20 \text{ kg}$, $v = 4 \text{ m/s}$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 20 \times 4^2 = 160 \text{ J}$$
- 6 Calculate the kinetic energy of a body weighing 20 Newton moving at a speed of 6 m/s.
 $w = 20 \text{ N}$, $v = 6 \text{ m/s}$, $g = 10$

$$w = m \times g$$

$$20 = m \times 10$$

$$m = 2 \text{ kg}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 2 \times 6 \times 6 = 36 \text{ J}$$



- 7 Calculate the kinetic energy of a body with a mass of (500 g) that covers a distance of 20 meters in (4 seconds).

$$m = 500 \text{ g} = \frac{500}{1000} = 0.5 \text{ kg} , d = 20 \text{ m} , t = 4 \text{ s}$$

$$v = \frac{d}{t} = \frac{20}{4} = 5 \text{ m/s}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 0.5 \times 5 \times 5 = 6.25 \text{ J}$$

- 8 A body moves at a speed of 20 km/h. Calculate the distance travelled after three hours?

$$v = 20 \text{ km/h} \quad t = 3 \text{ hour} \quad d = ?$$

$$d = v \times t = 20 \times 3 = 60 \text{ km}$$

- 9 A body does work of (50 joules) to move a bicycle a distance of 10 meter Calculate the amount of force required to do the work.

$$W = 50 \text{ J} \quad s = 10 \text{ m} \quad F = ?$$

$$F = \frac{W}{s} = \frac{50}{10} = 5 \text{ N}$$

- 10 A body with a potential energy of (240 joules) at a height of (12 meters) Calculate the weight of the body.

$$PE = 240 \text{ J} \quad h = 12 \text{ m} \quad W = ?$$

$$W = \frac{PE}{h} = \frac{240}{12} = 20 \text{ N}$$

Calculate the height of an object of mass is 6 kg above the ground when its potential energy is 180 J, knowing that the gravitational field intensity is 10 N/kg

$$h = \frac{PE}{g \times m} = \frac{180}{6 \times 10} = 3 \text{ m}$$

انتهت الأسئلة مع أطيب الامنيات بالنجاح والتوفيق



كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الثاني



Lesson 1

Metal

Non-metal

1	The outermost E. L less than 4 e ⁻ . (1,2,3)	1	The outer E.L more than 4 e ⁻ . (5,6,7) Except : H ₁ & C ₆
2	All are solids. Except mercury (the only liquid metal).	2	They are solid → Carbon (graphite) liquid → Bromine Gas → Hydrogen
3	They 're shiny (have metallic luster). Malleable ,ductile and formable	3	They don't have metallic luster. Not malleable, Ductile (Brittle)
4	Good conductor of heat, electricity.	4	Bad conductor of heat , electricity except (Graphite) <ul style="list-style-type: none">• Graphite is good conductor of electricity• Used in dry cell (battery)
5	High Melting point.	5	Low Melting point
6	Ex : Sodium, Copper, Zinc, silver, iron.	6	Ex : Carbon, Sulphur, phosphorus, Bromine, iodine
Give reason <ul style="list-style-type: none">• Copper can shape into forms? Because it's a metal & malleable, formable		Give reason <ul style="list-style-type: none">• Graphite used in manufacture of dry cell ? Because it's the only good electrical conductor non metal	
What happen when : <ul style="list-style-type: none">• Hammer a copper piece & a Sulphur piece ? The copper piece doesn't break, the Sulphur crumble easily as it is a brittle non-metal			

Metallic Bond

- ❖ Metallic crystal lattice
- ❖ The attraction force between positive metal ions & negative valence cloud
- ❖ The metallic bond responsible for : 1. metal hardness 2. High melting point
- ❖ As the valence number of metal increases, the strength of metallic bond increases, melting point increases (metal becomes harder)

Alloy

A mixture composed of the melts of 2 or more metals

- ❖ **Ex :** Bronze alloy → (95% copper + 5% tin)
- ❖ **Properties :** 1. Harder than copper 2. Resistant to rusting
- ❖ **Uses :** Jewellery, medals, statues



Recycling

A conversion process of wastes into new usable substances

❖ Some metals such as [Copper - Aluminum - Iron] are recycled for reasons:

1. Decrease percentage of them in Earth's crust
2. Difficult of extract them from ores & Lower cost of recycle

Metal + (cation)			Non metal – (anion)		
+1	Li ⁺	Na ⁺	-1	Cl ⁻	chloride
	K ⁺	Ag ⁺		F ⁻	fluoride
				Br ⁻	bromide
				I ⁻	iodide
+2	Hg ⁺²	Zn ⁺²	-2	O ⁻²	S ⁻²
	Ca ⁺²	Ba ⁺²			
+3	Al ⁺³				

All metals → Lose → Cation (positive)

All nonmetals → Gain → anion (negative)

Atomic groups

-1	Hydroxide → OH ⁻ Nitrate → NO ₃ ⁻ Nitrite → NO ₂ ⁻ Chlorite → ClO ₂ ⁻ Bicarbonate → HCO ₃ ⁻	+1	Ammonium → NH ₄ ⁺¹
-2	Carbonate → CO ₃ ⁻² Sulphite → SO ₃ ⁻² Sulphate → SO ₄ ⁻²		
-3	Phosphate → PO ₄ ⁻³		

Acids & Alkali (Base)

Acids		Alkalis	
Substance that dissolves in water Give positive Hydrogen ion (H ⁺) (H ⁺ Cation)		Substance that dissolves in water Give negative Hydroxide ion (OH ⁻) (OH ⁻ anion)	
Turn Blue litmus paper ^{into} → Red		Turn Red litmus paper ^{into} → Blue	
Ex. Lemon / Ketchup / Grapes		Ex. Detergent/ toothpaste/ Baking soda	
Nonmetal ⁻ (liquid state)	Atomic group (oxyacid)	Metal +	Atomic group
-1			↓
HCl → hydrochloric acid	HNO ₃ → Nitric acid	NaOH → sodium hydroxide (strong)	NH ₄ OH
HF → hydrofluoric acid	HNO ₂ → Nitrous acid	LiOH → Lithium hydroxide	Ammonium
HBr → hydrobromic acid	H ₂ SO ₄ → Sulphuric acid	KOH → Potassium hydroxide	Hydroxide
HI → hydroiodic acid	H ₂ SO ₃ → Sulphurous ---	AgOH → silver hydroxide	(Weak alkali)
(Hydro+anion+acid)	H ₂ CO ₃ → Carbonic ----		
Ide-----ic	HClO ₂ → Chlorous ----		
	H ₃ PO ₄ → Phosphoric ---		
	(Anion+acid)		
	ate-----ic		
	Ite-----ous		

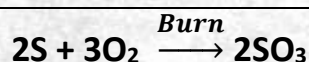


-2 $\text{H}_2\text{S} \rightarrow$ hydrosulphuric acid Except \rightarrow Oxygen	Except $\rightarrow \text{OH}^-$	$\text{Hg}(\text{OH})_2 \rightarrow$ Magnesium hydroxide $\text{Zn}(\text{OH})_2 \rightarrow$ Zinc hydroxide $\text{Ca}(\text{OH})_2 \rightarrow$ Calcium hydroxide $\text{Ba}(\text{OH})_2 \rightarrow$ Barium hydroxide	
Because: $\text{H}^+ + \text{OH}^- \rightarrow \text{HOH} = \text{H}_2\text{O}$ (Water)		$\text{Al}(\text{OH})_3 \rightarrow$ Aluminum hydroxide	
Importance of Acid Play important role in human body: 1- HCL Secreted by stomach to help in food digestion 2- Lactic acid Provide muscle with energy during Lack of oxygen If lactic acid accumulates in muscle Cause \rightarrow muscle cramps In gas state \rightarrow $\text{HCl} \rightarrow$ hydrogen chloride $\text{HBr} \rightarrow$ hydrogen bromide $\text{HI} \rightarrow$ hydrogen iodide		Importance of Alkali 1- $\text{Mg}(\text{OH})_2$ (Milk of magnesia) A temporary treat to Neutralize gastric acidity	

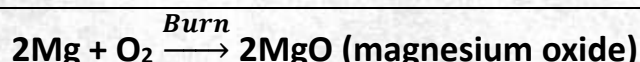
Conductivity of electricity

Acids H^+		Alkali OH^-	
Strong acid	Weak acid	Strong Alkali	Weak Alkali
Good electric conductor Ex. 1-Nitric acid 2-Sulphuric acid 3-HCl	Bad conductor 1- Nitrous acid 2- sulphureous acid 3- Vinegar (acetic acid)	Strong conductor Ex. NaOH	Weak conductor Ex. NH_4OH
Acid + Alkali \rightarrow Salt + Water $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$			
Acid + Acid \rightarrow don't react (Acidic oxide) non metal oxides Dissolve in water and forming Acids		Alkali + Alkali \rightarrow don't react (Basic oxide) metal oxides Dissolve in water and forming Alkali	





(nonmetal)



(metal)

**Acid Rains**

Rain results from dissolution of acidic oxides (nonmetal) in atmospheric water vapor

❖ **Ex :** NO₂ Nitrogen dioxide & SO₃ Sulphur trioxide → forming HNO₃ , H₂SO₄

❖ **Cause damage :**

1- Damage forests

2- Harm aquatic organisms

3- Building Corrosion

4- Health problems (Respiratory)

Lesson 3

Chemical indicators

GIVE REASON :

❖ It's dangerous to add Sulphuric acid to sugar?

Because it cause it to be burnt , so the acid is dangerous to →taste → smell → touch

Because some acids are burning & some Alkali are caustic

Indicators → They are chemical substance whose color differ in → acidic medium than →alkali medium

Examples: **1-Litmus paper indicator:**

1. In Acidic medium → Turn to Red due to H⁺ cation

2. In Neutral medium → don't change because H⁺ = OH⁻

3. In alkali medium → Turn to Blue due to OH⁻ anion

GIVE REASON :

- Litmus paper doesn't differ between a strong acid & weak acid?

Because it gives the same color with any acid (Red)

2- Universal indicators: (Dye ,solutions /Strips)

- An indicator that can differ between different acids (strong-weak) or different

Alkali Based on their strength

Gases (use wet litmus paper)

Acid gases Change color to Red Ex. CO ₂ gas (carbon dioxide)	Neutral gases Don't change color of indicators Ex. H ₂ , O ₂ , N ₂	Basic gases Change color to Blue Ex. NH ₃ gas ammonia
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Chlorine gas Cl₂ → bleach (Remove)the color of both red & blue



❖ The Flower color differ according to Soil Type in Hydrangea flowers

If acidic soil → Flower become blue color

If Basic soil → Flower become red color

Acidic soil → treated with BASIC SUBSTANCE → Ca(OH)_2 Calcium Hydroxide

Potential of hydrogen PH

A scale range between 0 : 14

used to determine Acidity & Basicity of solution

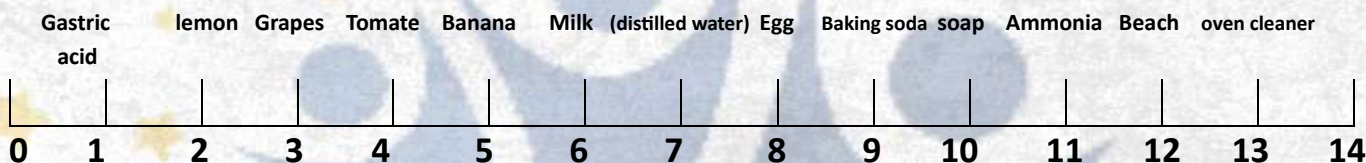
By → Soren Sorensen scientist

P_H		
Less than 7	= 7	More than 7
Strong acid ← Acidic → weak acid	Neutral	weak alkali ← Alkali → Strong alkali

Methodes to measure PH

1- **PH meter device** → measure accurately PH of any solution on a digital screen

2- **universal indicator strips** → measure approximately PH of solution by the color of strips compared to indicator (each color has definite)



GIVE REASON

❖ Alkalinity of ammonia solution more than Alkalinity of Baking soda?

Because P_H value of ammonia is more than (higher) Baking soda

❖ Acidity of lemon more than tomato?

Because P_H value of lemon lower than tomato

PH value : Dry hair shampoo differs than Oily hair shampoo

They 're ionic compounds formed by reaction of any (Acid + Alkali) → salt → water

Any salt start with + cation , then anion –

❖ sodium chloride → $\text{Na}^+ \text{Cl}^- \rightarrow \text{NaCl}$

❖ Aluminum phosphate → $\text{Al}^{+3} (\text{PO}_4)^{-3} \rightarrow \text{Al PO}_4$

❖ Aluminum sulphate → $\text{Al}^{+3} \text{SO}_4^{-2} \rightarrow \text{Al}_2(\text{SO}_4)_3$

Salts



Salt properties

- 1-they are solids substances
- 2- conduct electricity in their solutions or molten salt (melts)
Don't conduct in solid state
- 3-Differ in color → 1.white salts :- zinc sulphate – sodium carbonate
2. green salt :- nickel chloride (NiCl_2)
3. Blue salt :- copper sulphate (CuSO_4)
4. Salts differ in solubility in water

Soluble salts (dissolve)=solution
All Sodium, potassium, ammonium,
nitrate salts, Nickel chloride (green),
copper sulphate (Blue) CuSO_4

insoluble salts (don't dissolve)= in water
all carbonate → except (Na , K , NH_4) salts
Silver chloride (AgCl),
calcium sulphate (CaSO_4)

5.PH of salts → Acidic = NH_4Cl , Neutral= NaCl , Alkaline= Na_2CO_3

GIVE REASON

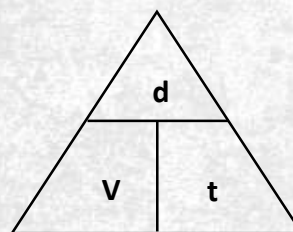
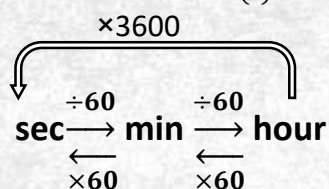
- ❖ It's not possible to drown in the dead sea? [salinity 10 times higher Red sea]
Because the high salts percentage in water lead to increase density

Lesson 1

Unit (2)
Potential Energy (P.E)

- ❖ **Path of movement** → a set of points that object pass during its motion
- ❖ **Distance (d)** → the total length of moved object from [start point] → [end point]
- ❖ **Displacement** → the shortest straight path in constant direction from [start] → [end]
- Distance and Displacement measured by $\text{cm} \xleftrightarrow{\div 100} \text{m} \xleftrightarrow{\div 1000} \text{Km}$
- ❖ **Speed (V)** → the distance covered per unit time

Speed = $\frac{\text{distance}(d)}{\text{time}(t)}$ → measuring units [meter/second (m/s), Km/hour (Km/h)]



➤ What happen when

Exceeding the speed limits? —————> Increase road accidents

❖ **Work (W)** → the amount of energy to move object in a certain displacement in the same direction of acting force

- Force increase , work increase

➤ **GIVE REASON**

❖ A person who pull a tree don't do work?

Because displacement is equal zero (At rest)

❖ A person who carry back pack don't do work?

Because force affect perpendicular to motion

$$\text{Work} = \text{Force} \times \text{Displacement}$$

$$(W) = (F) \times (S)$$

$$\text{Joule(J)} = \text{Newton (N)} \times \text{meter(m)}$$

$$\text{Joule} \xrightarrow{\div 1000} \text{KJ}$$

$$\text{KJ} \xrightarrow{\times 1000} \text{Joule}$$

Controlling the Variables

❖ It's skills in scientific research and design of scientific comparative experiments..

❖ **Independent Variable (cause)** → a variable changed during the experiment.❖ **Dependent Variable (Effect)** → a variable tested & change by change independent.❖ **Controlled Variables** → variables controlled to remain constant in experiment.❖ **Energy (E)** → The ability to do work & measuring unit is Joule (J)

- Forms of energy → 1. Potential energy 2. kinetic energy

1. **Potential energy (PE)** → energy stored in object due to work done on it (Joule)

➤ Factors effect on PE → 1. weight of object(W) [Newton]

2. Height of object (h) meter

- AS weight, Height increase, PE Will increase

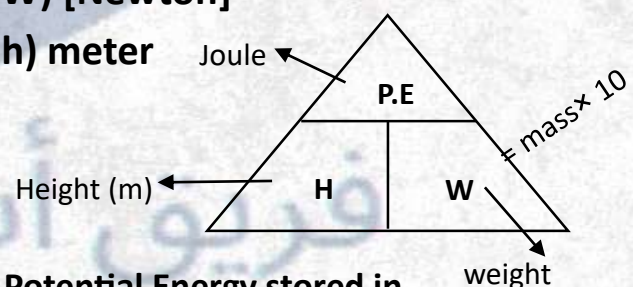
❖ **What's meant by** → PE equals Zero?

-Means that object at surface of ground

➤ **Note:** the Chemical Energy found in Food is Potential Energy stored in Fuel Chemical Bond & Convert to KE when chemical reaction occurs

➤ **What happens when :**

1- Weight is doubled "with constant height" → potential energy doubles



2- Height decrease to half "with constant weight" → potential energy decrease to half

3- Weight is doubled & Height decrease to half → potential energy remains constant

Lesson 2

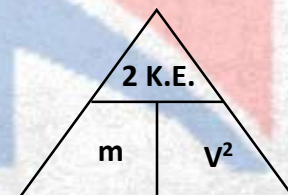
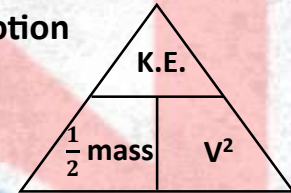
Kinetic Energy (K.E)

❖ **Kinetic Energy** → it's Energy acquired by object due to its motion (work done during object's motion) measured by Joule

❖ **Factors affecting on K.E.** → 1- mass of object (Kg)
2- speed of object (m/s)

• $KE = \frac{1}{2} \text{ mass}(m) \times \text{square of speed } (V^2)$

As → mass Increase, KE will increase
→ speed

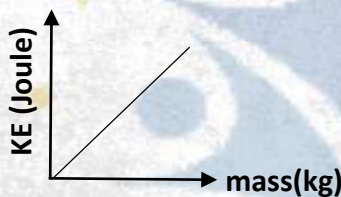


What's meant by :

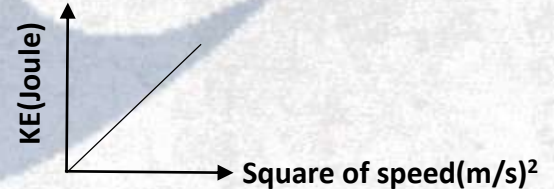
1- **kinetic energy equals Zero** → means that object at rest (speed=0)

The graphical relation between

KE & mass at constant speed



KE & speed at constant mass

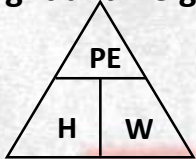
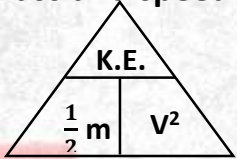


➤ **What happens when :**

- 1- **mass decrease to half** → KE decrease to half
- 2- **speed increase to double** → KE increase to four times value
- 3- **mass decrease to half & speed increases to double** → KE increase to double
- 4- **mass decrease to quarter & speed is doubled** → KE remain constant (unchanged)



➤ Compare between PE & KE

PE	KE
Energy stored in object due to work on it	Energy acquired by object due to motion
-affected by two Factors → weight and height -PE = H x W -unit (Joule)	-affected by two Factors → mass and speed -KE = $\frac{1}{2} mV^2$ -unit (Joule)
	

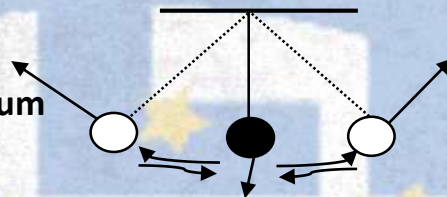
❖ **Mechanical Energy (ME)** → The sum of PE + KE of moving object

$$ME = PE + KE \quad (\text{Constant amount})$$

At maximum height (h) :

Potential energy → maximum

KE → Zero



at maximum height

PE = maximum

KE = Zero

Original Position

PE → Zero

KE → maximum

➤ The amount of decrease in PE = the amount of increase in KE

- As PE increases , KE decreases

➤ Give reason:

1. Despite the increase in PE on moving upward, the mechanical remain constant?

Bec. the increase in PE = the decrease in KE by same amount.

2. Avoid lift heavy objects in a manner harm your spine ?

To ensure a balanced distribution of weight on leg muscles Not the back.

Medicals Applications

❖ Avoid lifting heavy objects above ground in a manner harms your spine

the load on the leg muscles rather than the back to ensure a balanced distribution of weight



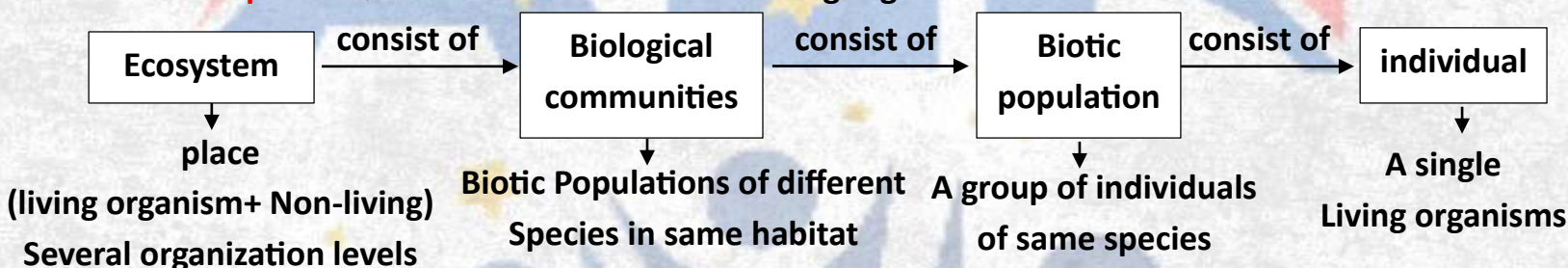
Life Applications

Generate electricity from high Dam	Demolition Ball
In Aswan by using water energy	Used to Demolishing old buildings
1- PE of water held behind the Dam	By convert
2- potential → converted to KE when rush down	PE $\xrightarrow{\text{into}}$ KE
3- KE drives turbines & generate electricity In sustainable way	stored in $\xrightarrow{\text{motion of ball}}$ -suspended in height

Lesson 1

Unit 3
Nutritional Relation Ships

- Ecosystem** → consist of living organisms + Non-living components
(Biotic) → plant / animal / birds + (a Biotic) → soil / air / water
- species** → The fundamental unit in living organisms classifications



Patterns of Nutrition Relational

methods to get food

1- Predation	2- Competition	3- Mutualism	4- Commensalism
a Nutritional Relation between two individuals in which			
one benefits (predator) the other: harmed (prey) -(predator) beneficiary Individual that benefit in predation -(prey) harmed Individual that : harmed , die in predation	two individuals of Same species "harmed" ↓ compete for limited food resource ↓ Negative impacts : Growth , survival	Both benefits ↓ Without harm each other	-One benefits(commensal) -The other neither harmed nor benefit (Host) -Commensal : individual benefits in commensalism -Host : individual neither benefit nor harmed in commensalism
Examples : 1- Lion → Zebra	Example :	Example : Pollen grains	Example : Plover Bird & Nile crocodile



2- chameleon → insects 3- Dionaea plant →insects (Venus fly trap)	Two Lions →one Zebra	Bee & flower 1- Bee Extract Nectar 2- Flower transfer pollen grains from bee's body to another flower for reproduction	- Bird feed on leftover food trapped between crocodile teeth
--	-------------------------	--	--

What happen when :

1- **Plover bird** don't feed on left over between teeth of crocodile?

It can live without cleaning its teeth from leftover food

2- **Decrease food resource for individuals of same population?**

Competition increase and affects their numbers

Living organisms classified into

1- Producer	2- Consumer	3- Decomposer
autotrophic organisms	Heterotrophic organisms	They 're living organisms that get food by Decomposition of
Make their food by photosynthesis	Depend directly or indirect on producer to get food	Organic substances → simpler substances ↓ Mix with (Soil)
Ex : Plant , green algae	Types of consumers: 1- Herbivores : (plant eaters) Characterized by incisors (for cutting plant) Ex: Horse, Rabbit 2- Carnivores : (meat eaters) Characterized by sharp canines (for tearing prey) Ex: Lion, Snake 3- Omnivores : (plant + animal eaters) Ex: Bear, Raven, Hedgehog, Mouse 4- Scavengers : Feed on remains of Dead organisms Ex : Hyena , Eagle , Cockroaches	Ex : Bacteria , Fungi



Energy flow among living organisms

Food chains	Food webs	Food pyramid
<p>The path of energy (food) moves From (one living organism) \xrightarrow{to} Another In Ecosystem</p> <p>-Atrophic level = stage transfer energy in food chain</p> <p>-consist of (producer, consumer ,decomposer)</p>	<p>It's interconnection & over lapping of multiple food chains together</p>	<p>A pyramid represents the flow of energy & its amount between different trophic levels in any food chain</p>
<p>Types:</p> <p>1-terrestrial 2-aquatic</p>		

Ex: Green grass \rightarrow locust \rightarrow frog \rightarrow snake \rightarrow fungus

Producers	Primary consumers (1 st level) consumers	Secondary consumers (2 nd level) consumers	Tertiary consumers (3 rd level) consumers	Decomposers

1. Terrestrial food chain					2. Aquatic food chain (north pole)			
Grass \rightarrow Rabbit \rightarrow snake \rightarrow Eagle \rightarrow Fungi Bacteria					Algae \rightarrow copepod \rightarrow fish \rightarrow seal			
autotrophic	Primary	Secondary	Tertiary	Decomposers	Producer	Crustacean Snail Protozoa shrimp		Polar Bear
Make its own food	Feed on grass	Feed on Primary	Feed on Secondary	Decompose dead	Seal is Tertiary consumer Polar bear is Quaternary consumer			
The same animal mat be prey & predator Predator \leftarrow snake \rightarrow prey to eagle								

➤ **1. Note :** Any food chain start with producer, then consumer & and with Decomposers

1. **Sun** \rightarrow is the main energy source on earth's surface

2. **Producers** \rightarrow get energy from the sun \xrightarrow{so} producers is the first trophic

3. **consumers** \rightarrow get energy from Producers directly or indirectly \xrightarrow{so} the higher trophic level

4. **Decomposers** \rightarrow get energy from dead organisms \rightarrow in the trophic level



➤ **BIOLOGICAL CONTROL:**

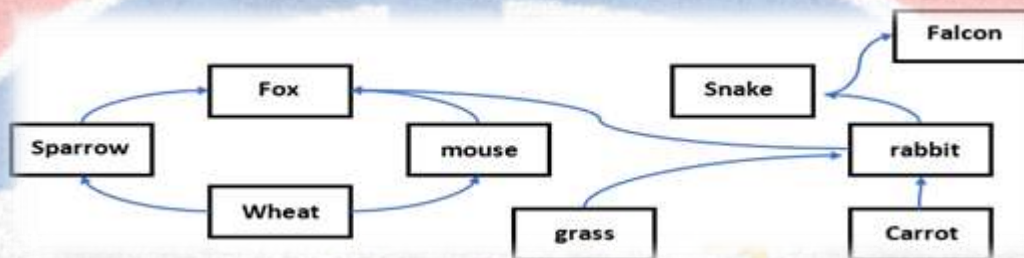
A method in which utilization of living organisms through food systems to eliminate agricultural pests instead of using pesticides.

Ex. Using dotted beetles (Lady bug)→to feed on an aphids insects→harm fruit& vegetables

➤ **Food web:** The interconnection and overlapping of multiple food chains together.

GIVE REASON: It's rare to find isolated food chain in Ecosystem?

- Because each simple single organism can feed on multiple sources of food chains lead to formation of food web



➤ **Ecological balance:**

If any organism is absent → will affect remaining individuals of food chain or food web
Cause → Destruction of ecological balance

1. Increase in Primary consumers LEADS TO → decrease producer → increase the secondary
2. Decrease in secondary consumers → LEADS TO → increase primary & decrease Tertiary

What happen Lack of food sources?

- Leads to increase competition and affects on its number in population

➤ **Energy pyramid:**

→ The apex is last consumer (TOP predator) & the base is producers

- 1- Only 10% of energy transferred from level \xrightarrow{to} the next level $\times \left[\frac{1}{10} \right]$
2. 90% Energy → is lost when moving from one trophic to another

Ex. Cow → lose 90% of energy from food & use 10% only for growth →the next
30% Heat ,60% undigested food



Genetic traits	Acquired traits	Instinctive behaviors
1. they are transmitted from parent ^{to} → offspring 2. inherited from one generation to another 3. without learning Ex. 1. hair color/ eye color 2. short legs of arctic fox 3. length of giraffe's neck 4. A hard skeleton on turtle	1. they are not transmitted from parent to offspring 2. not inherited 3. acquired by environment by Learning + Training Ex. 1. A child Learn walking 2. learn languages 3. A horse jump over obstacles 4. A dolphin play with a ball	1. Skills & Behavior transmitted from parent ^{to} → offspring 2. with learning Ex. 1. A bat sleep upside down 2. Chicken lay on egg 3. spider weave web 4. squirrel break hazelnut shell 5. Bird build nests

- **Reproduction:** a vital process aim to produce new individuals resemble their parent
 - Genetic traits transmitted by → Genetic material (chromosomes) found in [Nuclei of eukaryotes], [cytoplasm of prokaryotes]
- **Chromosome:**
 1. Thread like bodies that represent the genetic material of eukaryotes
 2. Responsible for → transmit genetic traits from parent ^{to} → offspring
 3. Same species individuals → have same number of chromosomes in somatic cell Liven and skin
 - The chromosome number vary from one organism to another
 - Each individual inherits → $\frac{1}{2}$ from father + $\frac{1}{2}$ from mother

Human	Corn	Bee
46	20	32



➤ **Structure of chromosome:**

1. **General composition:** each chromosome consists of 2 chromatids (threads) connected at centromere (central point)

2. **Chemical composition:** chromosome composed chemically of DNA (Nucleic acid) + protein(histones)

➤ DNA = Nucleic acid made of small segments (Genes)

- **Genes** → segments of DNA found in chromosome, Responsible for hereditary traits

- Each gene $\xrightarrow{\text{consist of}}$ Nucleotides → the smallest building unit of DNA

• **Double helix** → nucleotides that form two stands twisted around each other

Each chromosome carry thousands or millions of genes

Centromere → a central point connected 2 chromatids

• **Eukaryotes cell** → Nucleus → chromosome → DNA + Protein → Genes → Nucleotides

• **Genetics** → science that study transmission of genetic traits from parent $\xrightarrow{\text{to}}$ offspring

By **Gregor Mendel**

• **One gene – one enzyme hypothesis: by scientists** → by Beadle & Tatum

State that: each gene produces a specific enzyme → responsible for a chemical

reaction $\xrightarrow{\text{to form}}$ a protein (with a specific hereditary)

Gene → enzyme → chemical reaction → protein → hereditary traits

• **The inheritance of curly hair trait:**

When inherits the gene from parent, it produces enzyme → chemical reaction → protein → to express curly hair trait

➤ **GIVE REASON:** Difference in hereditary traits expressed by each gene?

- Due to difference in arrangement of Nucleotides on DNA



➤ **Mutation:** the emergence of a new hereditary traits that didn't exist previously

Due to change in nature of the gene responsible for it

Ex. 1. Huge types of cows 2. Six fingers on hand

1. Types of mutation according to the origin

Spontaneous mutations (Natural)	Induced Mutations (Artificial)
Mutation that occurs Naturally without Human intervention Ex. albino child from Black mother (albino Mutation) albinism	Mutations that occur by Human intervention Ex. Featherless Chickens production to Reduce electrical energy in Farms in hot area

2. Types of mutation according to their effects (impacts)

Harmful mutations	Beneficial Mutations
Mutation cause appearance of undesirable traits Some of them may lead to death Ex. 1. spinal deformity (curved spins) 2. severe muscular dystrophy (lethal) (Weakness of muscles in new born)	Mutations Cause appearance of (desirable traits) & occur Naturally or by Human Ex. 1. Natural Beneficial Mutations Change in <u>Skin Color</u> to adapt environment Light Skin Color in individuals Live in → Cold Countries to absorb vitamin D better.
Agricultural technique Not Mutation → Production of Cubic -Shaped watermelons watermelon in a square mold During growth to→ Facilitate their Transportation	2. induced beneficial mutations 1- Production of wheat Plant Resist (wheat rust disease) 2- Production of seedless Fruits

Lactose tolerance mutations → a spontaneous beneficial mutation Convert lactose sugar ^{into} → simple sugars → easy for body to absorb



individuals with lactose intolerance → feel
crampy, nausea or pain when drink milk +
produce (Milk-cheese-yogurt)

Butter ↓ Olive oil	Milk ↓ Soya milk	Coffee cream ↓ Almond milk	Milk chocolate ↓ Dark chocolate
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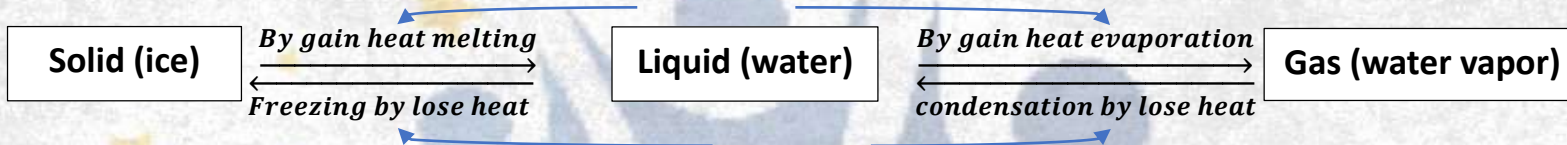
Lesson 1

Unit 4
Water cycle

- water Represent → 70% of Human body
→ 71% of Earth Surface → water bodies → 97% Salt water
→ 3% Fresh water

uses of water in different fields

1. Drinking
2. Agriculture
3. Sanitation
4. Hygiene
5. Regulate the Earth's Temperature



Evaporation

The change of water from liquid state ^{to} gas state by gain heat at any temp.

GIVE REASON:

The Rate of evaporation in Tropical Regions Faster than Polar regions?

Due to : Sunlight rays in Tropical regions are Vertical & have great effect But Sun
Light rays in Polar regions are inclined & have Larger area

➤ what's the Difference between evaporation & Boiling?

occur at any Temperature

occur at Certain Temp 100°C

(Both Convert from Liquid ^{to} Gas)

Condensation

❖ The change of water from Gas State ^{to} Liquid State By Losing Heat at Any Temp.

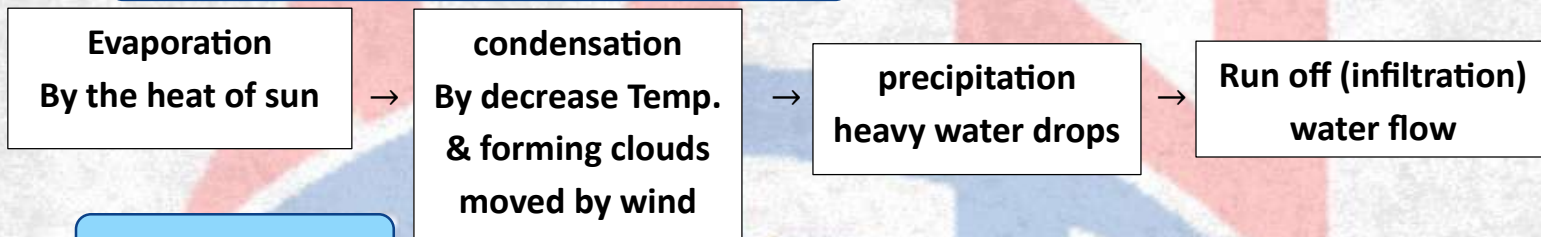


- ❖ **The Reverse of melting is** → Freezing
- ❖ **The Reverse of evaporation is** → Condensation

The water cycle

Natural Process involving the water movement between atmospheric air and Earth in closed multi-Path Cycle.

Multiple Pathways in water cycle



Precipitation

The process by which water fall from clouds to earth's surface in the form of (Rain- Snow- Hail) By Earth's gravity.

Snow → Formed when Temperature of clouds below the freezing Point.

Hail → formed when small ice crystals accumulate during thunder Storms

Surface Run off

Process of rainwater Flowing across earth's Surface & into (River – seas - Lakes) By gravity

GIVE REASON: Conservation of Freshwater is Essential?

Because to ensure its sustainability in the future

Sources of water vapor in Nature

Evaporation from water bodies	Transpiration in Plant	Sweat
Rivers/seas/oceans	It's the process by which Plant Lose water in the form of water vapor	By Human - animal



During Rain fall (Precipitation)

Portion	Other Portion
of Rain infiltrates into ground & Stored as Ground water	Other Portion Flow across the earth's Surface into Rivers/seas/oceans/Lakes (So it Renewed)

❖ There are 2 essential Factors that mountain water cycle in Nature:

**Desalination of seawater**

Removing dissolved Salts From Seawater

- ❖ **working Principle** : Evaporation + Condensation of seawater
- ❖ **importance** : Facing the Shortage of fresh water Resources for (Drinking , irrigation in far areas) **to get Fresh water**

Lesson 2

The Rock Cycle

- ❖ **Rocks**: Solid materials Composed of one or Several minerals.
- Found on Earth's Surface (beneath it / at the ocean bottom)
- ❖ **3 main Types of Rocks Are** → Sedimentary Rocks -Metamorphic Rocks -igneous Rocks
- * Processes in Rocks Formation: [Physical & Chemical]

1-weathering 2-Erosion 3-melting & Crystallization

1- Weathering: process of breakdown of Rocks & take millions of years.

➤ Types of weathering:

1-Mechanical weathering	2-Chemical weathering
A process of breaking down Rocks. without change in Chemical Structure	A process of breaking down Rocks with Change in Chemical Structure
Causes of Mechanical: 1- Freezing of water in Rocks Cracks -water freeze when Temp drops &	acid + mineral material + acid Rains Change the Rocks Chemically Exchange in Calcium Carbonate which make lime stone when add acid



expands→ ice melts →Cyde of melting, freezing & Break ROCKS. 2-water Flow 3- wind blowing→ in the white Desert National Park 4- Growth of Plants roots in Rocks 5- Thermal Expansion & Contraction of minerals of Rocks. expansion →when Temp rise at the Day Contraction→ when Temp drop at night	GIVE REASON The hot Springs of Yellow Stone. National Park is a chemical weathering? -Due to Effect of mineral-rich hot water Couse Rocks breakdown & Change it Chemically. <hr/> -Calcium Carbonate Powder Formed of Crushing of Lime Stone Rock used in making casts for individuals suffer from bone Fractures <hr/> Spherical weathering one chemical weathering Form in which Rock Turn into Spherical form By Continuous erosion Process. granite→ chemical weathering →Spherical Shape -Yellowstone national park good example
GIVE REASON ice melting is Mechanical? Because There is No change in Chemical water Structure	

2-Erosion

The Process of Transportation& Sedimentation of rock Fragments result From weathering away from origin area.

❖ Sedimentation

The process of deposition of Rock Particles Fragments Result from weathering process after transported in Sedimentation area

❖ Sediments

- Particles of rock Fragments that are Transported away from weathering area.
- when Rain Fall occur on Ethiopian plateau:

A weathering →Erosion →Deposition & Sedimentation

So, the water Come from Ethiopian Plateau appear brown in Color

Weather Erosion

Gravel sand silt clay $\xrightarrow{\text{fast flow}}$ sand silt clay $\xrightarrow{\text{medium flow}}$ silt clay $\xrightarrow{\text{slow flow}}$ clay

when Flow is fast \Rightarrow transport Large-Sized Sediments.

when Speed Flow↓ decrease, the size of transported sediments ↓decreases



The Erosion process is double-edged Sword

beneficial effects -Formation of agricultural Soil in Egypt -Formation of river delta	harmful effects erosion of Costal by Sea waves
---	---

after transportation & Sedimentation \Rightarrow Sediments Compact over the Years into layers & occur Lithification) which transform into Cemented Rock

Lithification

The Compaction of sediments $\xrightarrow{\text{into}}$ layers Forming sedimentary Rocks

Sedimentary Rocks: Cohesive Rocks from Sediments Lithification

- 1- They're Porous Rocks \Rightarrow Due to spaces between Sediments Particles.
- 2-They Contain Fossils \Rightarrow over the Year's

Examples of Sedimentary Rocks & Lime Stone - Sand Store - claystone

-what happen when increase pressure on Sediments??

Become more Cohesive Forming Sedimentary rocks over years

3-Melting and crystallization

- ❖ When rocks located beneath the Earth's surface are subjected to **pressure and heat** without reaching the melting point it forms metamorphic rocks
- ❖ **Metamorphic rocks:**
 - Rocks formed through the exposure of rocks located beneath the Earth's surface to pressure and heat without reaching their melting point.
- ❖ Examples of metamorphic rocks:
 1. **Marble:** Limestone \rightarrow Marble
 2. **Quartzite:** Sandstone \rightarrow Quartzite
- ❖ When temperature and pressure increase by moving from the Earth's crust towards its interior, the minerals melt form magma & lava
- ❖ **Magma:** An extremely hot molten material formed through the melting of minerals which compose certain rocks within the Earth's interior.
- ❖ **Lava:** Magma when it reaches the Earth's surface.
- ❖ **Igneous rock:** formed by the solidification of lava on the Earth's surface or from the solidification of magma between the cracks and the layers
- ❖ **Types of igneous rocks:** 1- Plutonic igneous rocks 2- Surface igneous rocks



Plutonic igneous rocks	Surface igneous rocks
Magma cools very slowly in the cracks and the layers of the Earth's crust...	Lava cools quickly on the surface of the Earth's crust.
What is the result of this? The formation of rocks with large crystals	What is the result of this? The formation of rocks with small crystals,
Ex: Granite & Gabbro	Ex: Basalt & Pumice

- **GIVE REASON?** It is possible to distinguish the crystals of granite by the naked eye, while that of basalt cannot
 - Because the crystals of granite are large due to the slow cooling of magma, while the crystals of basalt are small due to the rapid cooling of lava

❖ Rocks are used in construction:

1. The use of limestone in the construction of **The Pyramids of Giza in Egypt**
2. The use of marble in the construction of **The Taj Mahal in India**

❖ **The rock cycle:** Transformation of rocks from one type to another through several processes, such as weathering and erosion, extreme pressure and heat, melting and cooling.



❖ **The role of the geological processes to form fossil fuels:**

- The light energy of the sun is converted ^{into} chemical energy in plants through the photosynthesis process
- and a part is transferred to living organisms that feed on plants.

❖ **Fossil fuel:** was formed over millions of years as a result of a series of physical and chemical changes to organic substances (buried plants and animals) found in interior.



❖ Its type

1. Coal: from large trees over time
 2. Petroleum oil& Natural gas :from Marine microorganisms.
- **Methane gas:** major component of natural gas as form more than 90%

With my best wishes

Mrs/Menna Hussein



حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

الترم الثاني



Pony Revision on Unit 1 – Lesson 1

Metals and Nonmetals

First Week

1 Complete the following sentences:

1. The outermost energy level of metals contains four electrons, while that of nonmetals contains four electrons.
2. Element (A), with its outermost energy level (M) containing two electrons, is a, while element (B), with its outermost energy level (L) containing six electrons, is a
3. All metals are solids, except for, which is a liquid.
4. All nonmetals are bad conductors of electricity, except for, which is a good conductor of electricity.
5. Some nonmetals are solid materials, such as; gaseous materials, such as; and the only liquid is
6. The atoms of solid metals are arranged in a structure known as
7. The metallic bond is formed due to the attraction between the positive of a metal and the cloud of valence negative surrounding it.
8. The bronze alloy is composed of at 5% and at 95%.
9. The bronze alloy is used in manufacturing and
10. The bronze alloy is characterized by being than copper and to rust.

2 Cross out the odd word, and then write the relation between the remaining words:

1. Gold – Silver – Bromine – Mercury (.....)
.....
2. Phosphorus – Bromine – Mercury – Sulfur (.....)
.....
3. Graphite – Bromine – Phosphorus – Sulfur (.....)
.....
4. Iodine – Sulfur – Carbon – Hydrogen (.....)
.....
5. Bronze – Chlorine – Copper – Tin (.....)
.....



3 How do you differentiate between each of the following:

1. Phosphorus and iron, in terms of:

a. Metallic luster

b. Malleable and ductile

c. Conductivity of heat and electricity

d. Melting point

P.O.C	Phosphorus	Iron
a. Metallic luster
b. Malleable and ductile
c. Conductivity of heat and electricity
d. Melting point

2. Sodium and graphite, in terms of:

a. Metallic luster

b. Which one is opaque

P.O.C	Sodium	Graphite
a. Metallic luster
b. Which one is opaque?

3. Sulfur and copper, in terms of:

a. Malleable and ductile

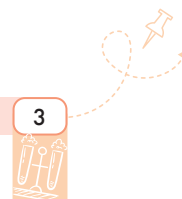
b. Which one is more brittle?

P.O.C	Sulfur	Copper
a. Malleable and ductile
b. Which one is more brittle?

4. Silver and phosphorus, in terms of:

Conductivity of electric current

P.O.C	Silver	Phosphorus
Conductivity of electric current





4 What is meant by each one of the following:

1. Metallic bond

.....

.....

2. Alloy

.....

3. Recycling

.....

.....

5 What is the benefit of recycling metal wastes?

.....

.....

6 If elements (A & B) have melting points of (1538 & 115.21) respectively, answer the following questions:

1. What is the type of each one of them? And why?

.....

.....

2. Which one of them is malleable and ductile?

.....

7 What happens if

1. We knock on a piece of graphite?

.....

.....

2. We increase the number of valence electrons in the metal atoms according to the metallic bond?

.....

3. We mix molten gold with molten copper?

.....





8 Give reasons for the following:

1. Calcium ($_{20}\text{Ca}$) is a metal, while Chlorine ($_{17}\text{Cl}$) is a nonmetal.

.....

.....

.....

2. Carbon is used in the manufacture of dry cells although it is a nonmetal.

.....

.....

.....

3. Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).

.....

.....

.....

4. A bronze alloy is used in the manufacture of medals instead of copper.

.....

.....

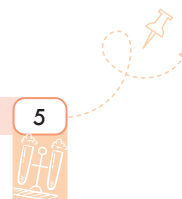
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9 Complete the following table that shows some materials & their properties.

You can choose the color from the following words bank:

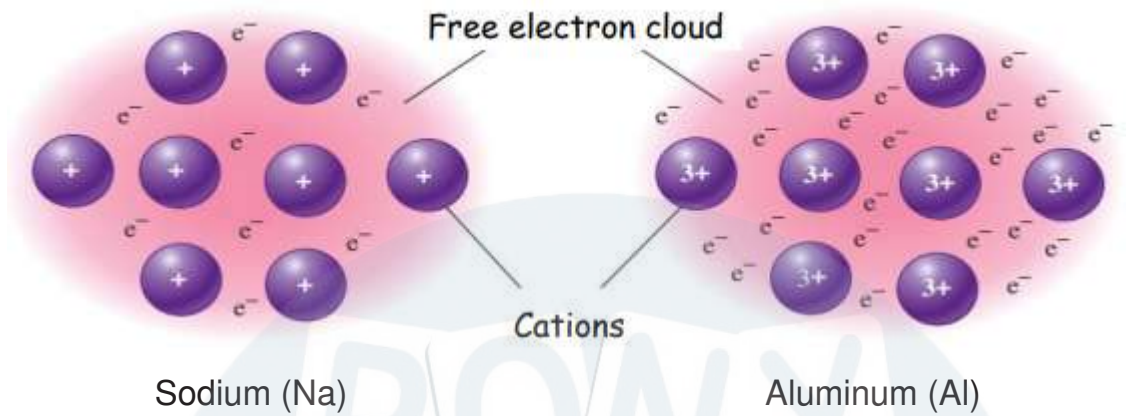
(Black - Colorless - Yellow - Waxy white - Silver - Red)

Element	Type	Physical State	Electric Conductivity	Color
1- Oxygen
2- Gold
3- Carbon
4- Bromine
5- Nitrogen
6- Mercury
7- Phosphorus





10 The following figure shows a bond between two different elements:



1. What are the types of the two elements in the figure? And why?

.....

..... سلسلة كتب الأستاذ

.....

2. What is the valency of each?

.....

.....

3. What is the type of bond in both of them?

.....

4. Which is stronger in terms of the bond? And why?

.....

.....

.....

.....



1 Complete the following sentences:

1. The scientist clarified that acids are substances that dissolve in water and produce, while bases, when dissolved in water, produce
2. The molecular formula of the carbonate group is, while the molecular formula of the sulphate group is
3. Oxygenated acids are those that contain element, such as and
4. Non-oxygenated acids don't contain element, such as and سلسلة كتب الاستاذ
5. The number of hydrogen atoms in an acid molecule is equal to the charge of the that forms it.
6. The number of hydroxide groups in a base molecule equals the charge of the that forms it.
7. Lactic acid provides the muscles with during a lack of oxygen, and its accumulation in the muscles causes
8. The molecular formula of acids starts with a positive cation, and their names are associated with the in their composition.
9. The molecular formula of alkalis (bases) ends with a, and their names are associated with the in their composition.
10. The molecular formula of alkalis (bases) that contain a cation Ca^{2+} is
11. The total charge of molecules of any compound equals
12. The stomach secretes acid, which helps in
13. Lemon and ketchup are considered substances, while toothpaste and baking soda are considered substances.
14. When hydrochloric acid dissolves in water, it produces a ion and a ion.



15. When magnesium hydroxide dissolves in water, it forms a ion and a ion.
16. Acids react with alkalis to form and
17. Nitric acid is considered from acids, while nitrous acid and sulfurous acid are considered from acids.
18. Metals burn in the presence of oxygen gas, forming, and most of them are known as oxides.
19. Nonmetals burn in the presence of oxygen gas, forming, and most of them are known as oxides.
20. The dissolution of sulphur trioxide (SO_3) in water forms
21. Dissolving in water forms magnesium hydroxide.
22. The combustion of fossil fuels produces oxides of and

2 How to differentiate between:

1. The bicarbonate group and the sulphate group, in terms of the number of charges they carry - the molecular formula.

P.O.C	Bicarbonate group	Sulphate group
a. The number of charges they carry
b. The molecular formula

2. Sulphuric acid and calcium hydroxide, in terms of the molecular formula.

P.O.C	Sulphuric acid	Calcium hydroxide
The molecular formula

3. Sulphurous acid and sulphuric acid, in terms of the molecular formula.

P.O.C	Sulphurous acid	Sulphuric acid
The molecular formula

4. Acidic oxides and basic oxides,
according to the definition - the result of their dissolution in water.

P.O.C	Acidic oxides	Basic oxides
a. Definition
b. The result of their dissolution in water

5. Sulphurous acid and sulphuric acid,
according to the molecular formula - strength and weakness.

P.O.C	Sulphurous acid	Sulphuric acid
a. The molecular formula
b. Strength and weakness

3 Give one example of each of the following:

- A positive atomic group.
.....
- A non-oxygenated acid that forms an anion in a liquid state.
.....
سلسلة كتب الأستاذ
- An acid secreted by the stomach.
.....
- An oxygenated acid that carries three negative charges.
.....
- An acid secreted by the muscles.
.....
- A weak acid.
.....
- A strong acid.
.....



8. A strong alkali.

.....

9. A weak alkali.

.....

10. A metallic oxide.

.....

11. A non-metallic oxide.

.....

4 Write the chemical formula for the following compounds:

1. Hydrosulphuric acid (.....)

2. Hydrobromic acid (.....)

3. Sulphurous acid (.....)

4. Phosphoric acid (.....)

5. Ammonium hydroxide (.....)

6. Hydrochloric acid (.....)

7. Sulphuric acid (.....)

8. Nitric acid (.....)

9. Potassium hydroxide (.....)

10. An atomic group consisting of three elements (.....)

11. Nitrous acid (.....)

5 Write the names of the following chemical compounds and state their type:

1. H_2SO_4 (.....) (.....)

2. H_2CO_3 (.....) (.....)

3. HCl (.....) (.....)

4. HNO_2 (.....) (.....)

5. MgO (.....) (.....)

6. SO_3 (.....) (.....)

7. $\text{Mg}(\text{OH})_2$ (.....) (.....)



8. H_2S (.....) (.....)

9. H_3PO_4 (.....) (.....)

10. $NaCl$ (.....) (.....)

6 What is meant by each of the following:

1. Atomic group

.....
.....

2. Acids

.....
.....

3. Alkalis

.....
.....

4. Acidic oxides

.....
.....

5. Basic oxides

.....
.....

6. Acid rains

.....
.....

7 What is the benefit of each of the following:

1. Stomach acid

.....
.....

2. Lactic acid

.....
.....

3. Milk of magnesia

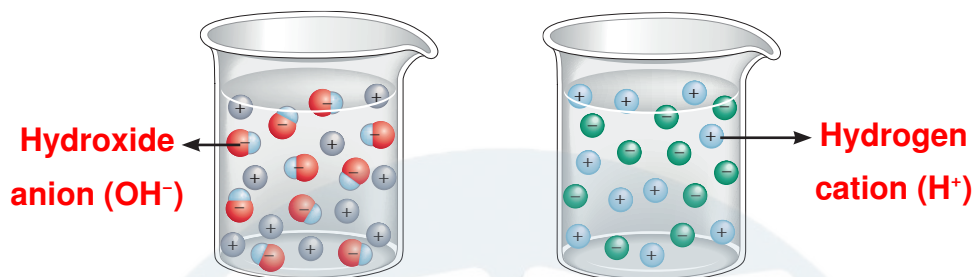
.....
.....

4. Litmus paper

.....
.....

8 Study the following figures, and then answer the questions below:

The two figures show two compounds, one alkaline and the other acidic.

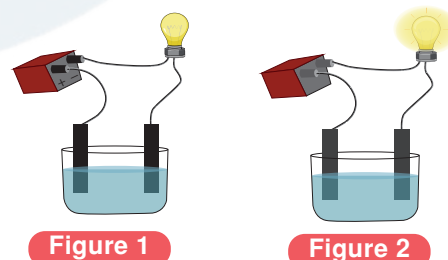


- Which is acidic and which is alkaline?
- Which of them results from the dissolution of a nonmetal and which results from the dissolution of a metal?
- What is the result of adding the first tube to the second tube?
- How do you differentiate between them with a litmus strip?

9 Study the following figures, and then answer the questions below:

The two opposite figures show two alkali compounds, which are sodium hydroxide and ammonium hydroxide.

- Write the chemical formula for each of them.



- Which one of them is weakly alkaline? And why?
- Which one of the two figures represents (NaOH)?

10 Study the following figures, and then answer the questions below:

The two figures show the combustion of two elements:



**Combustion of a
magnesium ribbon**



**Combustion of sulphur
crystals**

1. Which is a metal and which is a nonmetal?

.....

2. What is the result of combustion of each of them?

.....

.....

.....

3. How do we differentiate between them through practical experience?

.....

.....

.....

.....

11 Give reasons for the following:

1. Acids turn the blue litmus paper into red.

.....

2. Alkalis turn the red litmus paper into blue.

.....

3. Milk of magnesia is used to treat stomach acidity.

.....



12 What happens when:

1. An electric current passes through sulphuric acid and acetic acid, according to the lighting of the lamp?
.....
.....
.....
2. Acids are mixed with alkalis?
.....
3. You heat a piece of magnesium, and then add water to the product?
.....
.....
4. You heat a piece of sulphur?
.....
5. You add water to the previous product?
.....
6. You put a blue litmus paper in the previous solution?
.....
7. Sulphur oxide is dissolved in rain water?
.....

13 Mention the damages caused by acid rains.

.....

.....

.....

.....



Pony Revision on Unit 1 – Lesson 3

Chemical Indicators and Salts

Fourth Week

1 Complete the following sentences:

- are chemical substances that change their color in an acidic medium compared to a basic medium, such as
- Distilled water has a neutral effect and does not change the color of the litmus strip due to the equal number of ions with ions.
- There are many indicators, such as litmus strip and
- We reduce soil acidity by adding materials, such as
- The pH value of acids is than 7, while the pH value of is greater than 7.
- The pH value of a table salt solution (sodium chloride) is
- The pH value is accurately measured by using a device called
- Acidic gases include and
- Basic gases include
- Neutral gases, which do not affect a litmus strip, include and

2 Cross out the odd word, and then write the relation between the remaining words:

- Universal indicator strips – Litmus paper – Voltmeter – pH meter
(.....)
- $N_2 - H_2O - H_2 - HCl$
(.....)
- $SO_2 - Cl_2 - CO_2 - NH_3$
(.....)
- $HNO_3 - H_2SO_4 - H_2O - HCl$
(.....)

**3 How do you differentiate between each of the following:****1. Distilled water and hydrochloric acid in two ways**

P.O.C	Distilled water	Hydrochloric acid
a. By litmus indicator
b. By pH meter

2. CO₂ and O₂ gases

P.O.C	CO ₂	O ₂
a. By a wet litmus strip	سلسلة كتب الاستاذ..........	..........

3. Ammonia gas and nitrogen dioxide gas

P.O.C	Ammonia gas	Nitrogen dioxide
a. By a wet litmus strip

4 Give one example of each of the following:

1. A gas that turns the blue litmus strip into red.
2. A gas that turns the red litmus strip into blue.
3. A gas that has a neutral effect on the litmus paper.
4. A chemical indicator that measures the pH accurately.

5 What is meant by each one of the following:**1. Indicators**

.....
.....



2. Universal indicator

.....

.....

.....

3. pH value

.....

.....

6 Answer the following questions:

1. If you have nitric acid and nitrous acid:

1 Write their molecular formula.

.....

2 Which one is strong and which one is weak?

.....

3 How do you differentiate between them?

.....

.....

2. If you have two compounds (A) & (B) and their pH values are (8.5 and 3) respectively:

1 Determine the type of each one.

.....

.....

2 What happens when you mix them together?

.....

7 Give reasons for the following:

1. Litmus paper is not suitable for distinguishing between strong and weak acids.

.....

2. Litmus paper doesn't affect distilled water.

.....

.....



3. Nitric acid turns the blue litmus paper into red.

.....

4. Calcium hydroxide turns the red litmus paper into blue.

.....

8 What happens in each one of the following:

1. You put a piece of sugar in a test tube containing sulphuric acid?

.....

2. You place two red and blue litmus strips in a tube of hydrogen gas?

.....

3. You place two red and blue litmus strips in a tube containing chlorine gas?

.....

4. You place two red and blue litmus strips in a tube containing carbon dioxide gas?

.....

.....

5. You place two red and blue litmus strips in a tube containing ammonia gas?

.....

.....

6. You add calcium hydroxide to acidic soil?

.....

.....



Pony Revision on Unit 2

Energy and Its Applications

Sixth and
Seventh Weeks

1 Complete the following sentences:

Lesson 1: Potential Energy

- and are the measuring units of distance and displacement.
- and are the measuring units of speed.
- Speed =
- is the measuring unit of work, while newton is the measuring unit of
- = Force \times Displacement
- The factors affecting potential energy are and
- is the measuring unit of weight.
- Five kilometers = meters, while three kilojoules = joules.

Lesson 2: Kinetic Energy

- The factors affecting the kinetic energy of an object are and
- The measuring unit of kinetic energy is and is equal to
- The kinetic energy of an object =
- Kinetic energy is proportional to mass and
- The more the mass of the object, the the speed when the kinetic energy is constant.
- If the speed of the body increases into three times, its kinetic energy increases into times of its value.

2 Choose from columns (B) and (C) what suits column (A):

Lesson 1: Potential Energy

Column (A)	Column (B)	Column (C)
1. Work	1. m/s	1. $w \times h$
2. Potential energy	2. N	2. $F \times s$
3. Weight	3. J	3. $m \times g$
4. Speed	4. N.m	4. $d \div t$
1.	2.	3.
4.		

**3 Complete the following table:****Lesson 2: Kinetic Energy**

Number	Kinetic Energy (KE) (Joules)	Speed (v) (m/s)	Mass (m) (kg)
(1)	.....	8	2
(2)	48	4	.....
(3)	96	.....	6

4 Compare between:**Lesson 2: Kinetic Energy**

Kinetic energy and potential energy in terms of:

Definition – mathematical relationship – affecting factors

Device	Kinetic Energy	Potential Energy
a. Definition
b. Mathematical Relationship
c. Affecting Factors

5 What is meant by each of the following?**Lesson 1: Potential Energy**

1. Movement path.

.....

2. Distance.

.....

.....

3. Displacement.

.....

.....



4. Speed.

.....

5. Work.

.....

6. Energy.

.....

7. Potential energy.

.....

8. The independent variable.

.....

9. The dependent variable. سلسلة كتب الاستاذ

.....

10. Controlled variables.

.....

.....

Lesson 2: Kinetic Energy

11. Kinetic energy. سلسلة كتب الاستاذ

.....

.....

.....

6 What is meant by:

Lesson 1: Potential Energy

1. The distance traveled by an object is 50 meters.

.....

.....

2. The displacement of a body is 30 meters.

.....

.....



3. A body's speed is 120 km/h.

.....

4. A moving car travels 720 meters in two minutes.

.....

.....

5. The potential energy of a body is 60 joules.

.....

.....

6. The energy stored in a body as a result of the work done is 0.5 kilojoules.

.....

Lesson 2: Kinetic Energy

7. The kinetic energy of an object is 250 joules.

.....

.....

7 What happens when:

Lesson 2: Kinetic Energy

1. The speed of a moving object increases into the double with a constant mass, according to its kinetic energy?

.....

2. The mass is doubled and the speed is decreased to half, according to the kinetic energy?

.....

3. Two cars, (1) and (2), move at different speeds and have the same mass, according to the kinetic energy?

.....

8 When will the following happen?

Lesson 1: Potential Energy

1. The speed is equal to zero.

.....



2. The work is equal to zero.

.....

.....

.....

3. The potential energy equals zero.

.....

.....

4. The distance equals the displacement.

.....

5. The speed equals the distance.

.....

Lesson 2: Kinetic Energy

6. The kinetic energy = zero.

.....

7. The kinetic energy is numerically equal twice the mass of the body.

.....

9 Give reasons for:

Lesson 1: Potential Energy

1. The work done by a car is less than the work done by a truck, even though their speeds are equal.

.....

.....

2. The work required to stop a moving car at a high speed increases.

.....

.....

Lesson 2: Kinetic Energy

3. The kinetic energy of the car decreases when the driver presses the car's brakes.

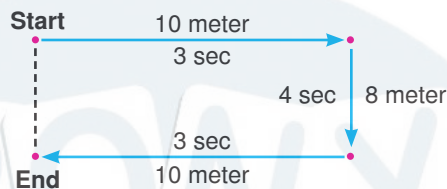
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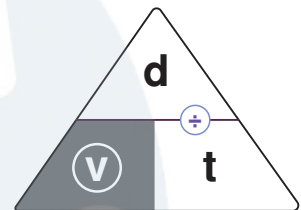
10 Problems:

Lesson 1: Potential Energy

- A body moves 10 meters east in 3 seconds, then moves 8 meters south in 4 seconds, then moves 10 meters west in 3 seconds. Calculate:
 - Total distance
 - Displacement
 - Body speed



-
-
-

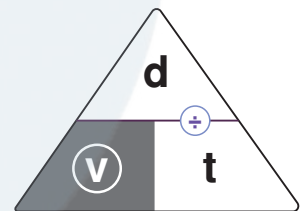


- Calculate the speed of a body that covered a distance of 50 km in two hours.

.....

.....

.....

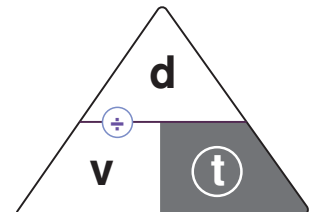


- Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s.

.....

.....

.....

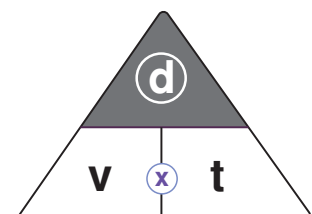


- If a body moves at a speed of 20 km/h, calculate the distance traveled after three hours.

.....

.....

.....

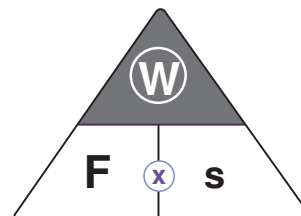


5. A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.

.....

.....

.....

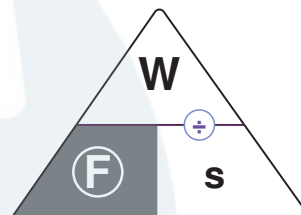


6. A body does work of 50 joules to move a bicycle a distance of 10 meters. Calculate the amount of force required to do the work.

.....

.....

.....

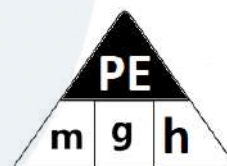


7. Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm, knowing that the acceleration due to gravity is 10 Newton/kg.

.....

.....

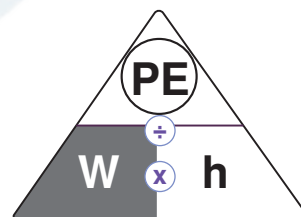
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8. If a body has a potential energy of 240 joules at a height of 12 meters, calculate the weight of the body.

.....

.....



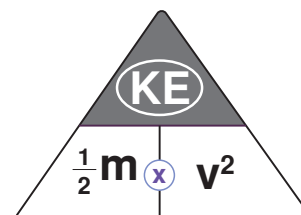
Lesson 2: Kinetic Energy

9. Calculate the kinetic energy of a ball with a mass of 20 kg moving at a speed of 4 m/s.

.....

.....

.....





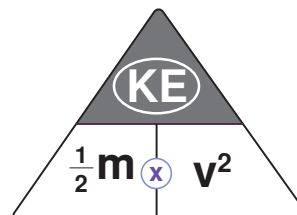
10. Calculate the kinetic energy of a body weighing 20 Newtons moving at a speed of 6 m/s.

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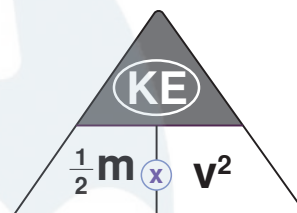
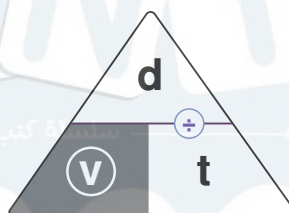
11. Calculate the kinetic energy of a body with a mass of 500 g that travels 20 meters in 4 seconds.

.....

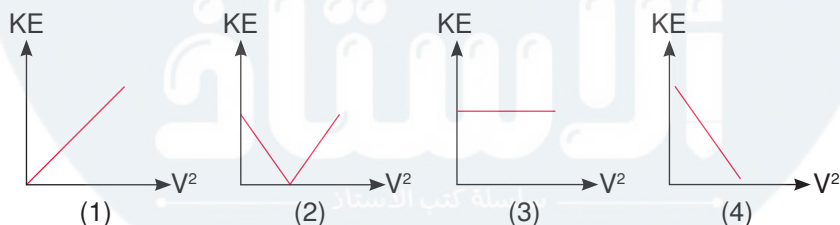
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12. The following figures show the relationship between kinetic energy and velocity when the mass is constant. Determine which of them represents:



1. Its kinetic energy increases.
2. Its kinetic energy decreases.
3. Its kinetic energy remains constant.

(.....)

(.....)

(.....)



Pony Revision on Unit 3 – Lesson 1

Nutritional Relationship in Biological Communities

Eighth and
Ninth Weeks

1 Complete the following sentences:

1. The ecosystem consists of and
2. There are non-living components in the ecosystem, such as and
3. The ecosystem consists of several levels: the individual,, and
4. is considered the basic unit in the classification of living organisms.
5. is the individual that benefits from commensalism.
6. is the one that is neither benefited nor harmed in commensalism.
7. Each stage in which energy is transferred in the food chain is called
8. The rabbit and the horse are considered because they have for cutting plants.
9. Carnivorous animals, such as and, are characterized by having sharp canines to their prey.
10. Omnivorous animals, such as and, feed on both meat and plants.
11. Hyenas and vultures are considered as they feed on the remains of dead organisms.

2 What is meant by each of the following?

1. Ecosystem

.....

.....

2. Biocommunity

.....

.....

3. The individual

.....



4. Predation

.....

.....

5. Competition

.....

.....

.....

6. Mutualism

.....

.....

7. Commensalism

.....

.....

.....

8. Decomposers

.....

.....

9. Food chain

.....

.....

10. Food web

.....

.....

11. Energy pyramid

.....

.....

12. Biological control

.....

.....

.....





3 Mention the type of food relationship in each of the following:

1. The remora fish that sticks to the shark's body and gets its food remains without affecting the shark. (.....)
2. Falcons hunt mice. (.....)
3. The trees in the forest are densely packed together, blocking light from the short trees. (.....)
4. Spiders hunt insects. (.....)
5. Algae live inside the coral tissues and carry out photosynthesis, which provides food for corals, while corals get oxygen and nutrients. (.....)
6. Lions compete for gazelles. (.....)

4 What happens when:

1. Food sources lack in a balanced ecosystem?
.....
.....
2. Food shortage occurs for a group of hyenas?
.....
.....
3. One of the living organisms present in a balanced ecosystem is absent?
.....
.....
4. The number of primary consumers increases?
.....
.....
5. The number of secondary consumers decreases?
.....
.....





5 Study the figures below, then answer the following questions:



a. Which of these creatures is a carnivore, omnivore, herbivore, or scavenger?

.....

.....

b. Compare between the lion and the horse in terms of:
Type of food – Shape of the teeth

P.O.C	Lion	Horse
a. Type of Food
b. Shape of the Teeth

6 The following figure shows a living organism. Answer the questions below:

a. What is the name of this organism?

.....

b. What organisms does it feed on?

.....

c. What is the benefit of this organism to the environment?

.....



7

Fungi – Sparrow – Fox – Falcon – Snake – Fish – Bear – Algae – Lion

Food chains:

Food web:

8

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Sparrow –

Fox – Falcon – Snake – Fish – Bear – Algae – Lion

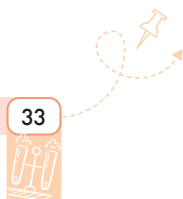
1 Put (✓) or (X):

1. Inherited traits are those passed from offspring to parents. ()
2. The brown eye color is an acquired trait. ()
3. The presence of a solid body structure covering the turtle is an inherited trait. ()
4. Instinctive behaviors are passed from parents to offspring without learning. ()
5. Acquired traits are not inherited and are acquired by humans from the environment. ()
6. Breastfeeding is an acquired trait. ()
7. The genetic material is found in the cytoplasm of the eukaryotes. ()
8. Chromosomes are thread-like bodies found inside the nucleus in the bean plant. ()
9. A chromosome consists of two strands, each of which is called a chromatid. ()
10. The number of chromosomes in humans is 46 chromosomes, and in corn is 32 chromosomes. ()
11. The chromosome is chemically composed of DNA and protein. ()
12. DNA is made up of small parts known as nucleotides. ()
13. Spontaneous mutation occurs without human intervention. ()
14. Production of featherless chickens is considered induced mutation. ()
15. Scoliosis (spinal deformity) is a lethal mutation. ()
16. Severe muscle atrophy and weakness is a lethal mutation. ()
17. The light skin color of people living in cold regions is a beneficial mutation. ()
18. Production of cube-shaped watermelons is an example of induced mutations. ()
19. People who suffer from lactose intolerance experience cramps and nausea when they eat meat. ()
20. Beneficial mutations cause the appearance of desirable traits. ()



2 Complete the following sentences:

1. The genetic material is found in the of prokaryotic organisms, and in the of eukaryotic organisms.
2. Examples of hereditary traits in humans are and
3. Examples of acquired traits in humans are and
4. A hen sitting on eggs is an example of a/an behavior, while a dolphin playing with a ball is a/an trait.
5. Chromosomes are found in a shape inside the nucleus.
6. Genetic traits are passed from parents to offspring through
7. A chromosome is made up of connected at the
8. The chromosome chemically consists of and a protein known as
9. DNA is made up of small units called
10. Each gene consists of smaller units called
11. Nucleotides exist in the form of twisted around each other, and the two strands are called
12. Each chromosome carries thousands or millions of, which vary in number from one chromosome to another in the cells of the same individual.
13. The mixture used in separating a strawberry chromosome consists of and with
14. is considered the founder of genetics, and he conducted his experiments on the plant.
15. The scientists and arrived at a working hypothesis for expressing genetic traits and it is known as
16. Genes produce, which are responsible for a chemical reaction that leads to the formation of, showing the genetic trait.
17. Spinal curvature is a result of mutations, while is a result of lethal mutations.





18. The production of seedless lemons is a result of mutations.

3 Give one example of each of the following:

1. A hereditary trait in humans. (.....)
2. An acquired trait in a horse. (.....)
3. An instinctive behavior in a chicken. (.....)
4. A spontaneous mutation in humans. (.....)
5. An induced mutation in chickens. (.....)
6. A beneficial mutation in humans. (.....)
7. A fatal (lethal) mutation in humans. (.....)
8. A harmful mutation in humans. (.....)
9. An alternative to butter for a person suffering from lactose intolerance. (.....)
10. An alternative to milk for a person suffering from lactose intolerance. (.....)
11. An alternative to chocolate milk for a person suffering from lactose intolerance. (.....)

4 Classify the following as hereditary traits, acquired traits, or instinctive behaviors:

1. Reading and writing (.....)
2. The length of a giraffe's neck (.....)
3. The squirrel breaking the shell of a nut (.....)
4. Learning to swim (.....)
5. The spider weaving its net (.....)
6. The short legs of the Arctic fox (.....)
7. Learning Hindi (.....)
8. Birds incubating eggs (.....)
9. Horses jumping hurdles (.....)
10. Facial freckles (.....)



11. Breastfeeding (.....)
12. Blood type (.....)
13. The dolphin playing with a ball (.....)
14. The bat sleeping upside down (.....)
15. Hair color (.....)

5 Compare between:

1. Hereditary traits and acquired traits, in terms of: Definition – Examples

P.O.C	Hereditary Traits	Acquired Traits
a. Definition
b. Examples

2. Acquired traits and instinctive behaviors, in terms of: Definition – Examples

P.O.C	Acquired Traits	Instinctive Behaviors
a. Definition
b. Examples

3. Spontaneous mutation and induced mutation in terms of: Definition - Examples

P.O.C	Spontaneous Mutation	Induced Mutation
a. Definition
b. Examples

**4. Harmful mutation and lethal mutation in terms of examples**

P.O.C	Harmful Mutation	Lethal Mutation
Examples	<div></div>	<div></div>

6 What is meant by each of the following?**1. Genetics****2. Inherited traits****3. Instinctive behaviors****4. Acquired traits****5. Chromosomes****6. Centromere****7. Mutation****8. Spontaneous mutations****9. Induced mutations**



7 Give reasons for:

1. The genes found on a single chromosome are different.
.....
.....
2. DNA is known as a double helix.
.....
.....
3. Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.
.....
.....
.....
4. A squirrel breaking a nut is considered an instinctive behavior.
.....
.....
5. Mendel is considered the founder of genetics.
.....
.....
6. Genes are considered responsible for the appearance of hereditary traits.
.....
.....
.....
7. A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation.
.....
8. Light skin color in people living in cold regions is a beneficial spontaneous mutation.
.....
.....
9. Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.
.....





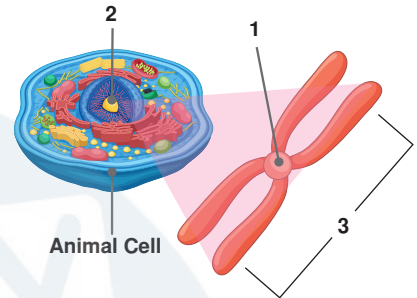
10. Lactose tolerance is considered a beneficial mutation.

.....

.....

8 Complete the data on the drawing:

1.
2.
3.



Determine the location of number (3) in bacteria and rabbits.

.....

.....

9 What are the consequences of:

1. A difference in the order of nucleotides in a single chromosome?

.....

.....

.....

2. The formation of genes for certain enzymes?

.....

.....

.....

.....

.....

3. Muscle atrophy and weakness in newborns?

.....

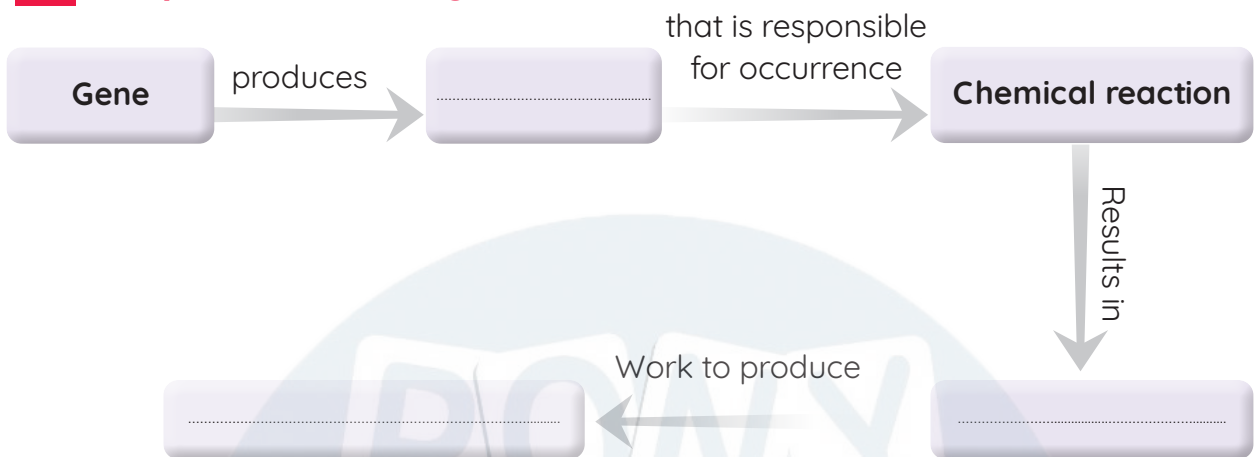
4. Placing watermelons in square-shaped metal molds when they grow?

.....

10 What is the benefit of genes?

.....



11 Complete the following chart:**12 From the opposite figure:**

1. What is this child known as?
.....
2. What is the reason for the child being born in this way?
.....



1 Put (✓) or (X):

1. The importance of the water cycle in nature is the renewal of water resources. ()
2. Water evaporates when it cools. ()
3. Water is used in many fields, including agriculture and industry. ()
4. The higher the temperature of water vapor, the faster the condensation. ()
5. There are many forms of precipitation, such as rain, snow, and hail. ()
6. Evaporation of water occurs when it comes into contact with a cold surface. ()
7. Winds move clouds containing heavier or smaller water droplets. ()

2 Complete the following sentences:

1. Water exists in three states, which are _____, solid, and _____.
2. Water changes from the liquid state to the _____ state when it gains _____.
3. Water changes from the gaseous state to the liquid state when it loses heat in a process known as _____.
4. Sources of water vapor in nature include _____, _____, and _____.
5. _____ is stored beneath the Earth's surface.
6. The basic stages of the water cycle are _____, condensation, _____, surface runoff, and _____.

3 Compare between:

1. Infiltration and surface runoff

Infiltration	Surface Runoff
.....
.....
.....

2. Evaporation and transpiration

Evaporation	Transpiration
.....
.....
.....

4 Choose from column (B) what suits it in column (A) :

Column (A)	Column (B)
1. The percentage of water in the human body.	a. 3%
2. The percentage of fresh water compared to the percentage of water on the Earth's surface.	b. 97%
3. The percentage of land in the Earth's composition.	c. 71%
4. The percentage of salt water compared to the percentage of water on the Earth's surface.	d. 29%
5. The percentage of water in the Earth's composition.	e. 70%
1. 2. 3. 4. 5.	

5 What is meant by each of the following:

1. Evaporation

.....

.....

2. Boiling

.....

.....

.....

3. Condensation

.....

.....

4. The water cycle

.....

.....



5. Transpiration process

.....

.....

6 State the importance of:

1. Water

.....

.....

2. The Sun in the water cycle in nature

.....

3. Gravity in the water cycle in nature

.....

4. Wind in the water cycle in nature

.....

5. The water cycle

.....

.....

7 Give reasons for the following:

1. Fresh water consumption must be rationalized.

.....

2. Water droplets form on the outer surface of a cup containing water and ice cubes.

.....

.....

3. The Sun and gravity maintain the continuity of the water cycle.

.....

.....

.....

4. Sea and ocean water are desalinated.

.....





8 What are the results of:

1. Placing a cup of water in a sunny place for several hours?

.....

.....

2. Placing pieces of ice in a cup of water?

.....

.....

3. The water cycle stopping suddenly?

.....

.....

4. The cloud temperature being below the freezing point?

.....

.....

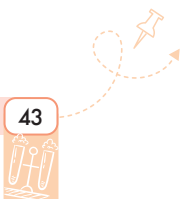
5. Small ice crystals gathering during thunderstorms?

.....

.....

الأستاذ

سلسلة كتب الأستاذ



1 Put (✓) or (X):

1. Rocks are solid bodies composed of only one mineral. ()
2. Rocks are classified into three types: sedimentary, igneous, and calcareous. ()
3. Only chemical changes lead to geological processes in rocks. ()
4. Weathering is the process of disintegrating and breaking down rocks. ()
5. Mechanical weathering is the process of disintegrating and breaking rocks without a change in their chemical composition. ()
6. Chemical weathering is the process of disintegrating and breaking rocks with a change in their properties. ()
7. Freezing of water in rock cracks causes the rocks to freeze. ()
8. Yellowstone National Park is a good example of chemical weathering. ()
9. Calcium carbonate powder is used to make casts for broken bones. ()

2 Complete the following sentences:

1. Rocks are classified into three types: _____, _____, and _____.
2. The freezing of water in cracks is one of the causes of _____.
3. The freezing of water in cracks, _____, and the thermal expansion and contraction of the minerals forming the rocks are among the causes of mechanical weathering.
4. Spherical weathering is a form of _____.
5. _____ and _____ are examples of sedimentary rocks.
6. Chemical substances, such as _____ and the mineral materials present in groundwater, cause chemical weathering.
7. _____ powder is used in making casts used for patients with bone fractures.

8. Sedimentary rocks are characterized by being and containing
9. When sedimentary rocks are exposed to and, they transform into metamorphic rocks.
10. When limestone rocks are exposed to heat and pressure, they transform into
11. When rocks are exposed to heat and pressure, they transform into quartzite rocks.
12. Igneous rocks are classified into two types: and
13. Examples of metamorphic rocks are and
14. Basalt rocks and are igneous rocks.
15. and are plutonic igneous rocks.
16. When sediments are exposed to compaction and lithification, they transform into
17. When igneous rocks are exposed to and, they transform into sediments.
18. Metamorphic rocks form when and rocks are exposed to heat and pressure.
19. Plants represent the organic source for the formation of , while represent the organic source for the formation of petroleum.
20. Natural gas is composed of, which makes up 90% of its components.

3 Which of the following rocks are sedimentary, igneous, or metamorphic rocks?

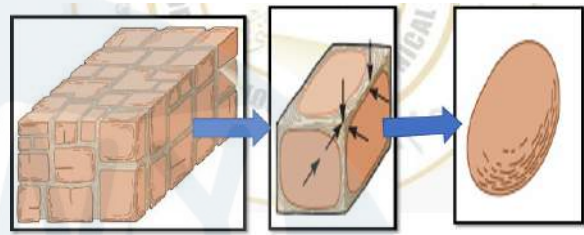
- | | |
|--------------|---------|
| 1. Granite | (.....) |
| 2. Marble | (.....) |
| 3. Limestone | (.....) |
| 4. Pumice | (.....) |
| 5. Basalt | (.....) |



- 6. Claystone (.....)
- 7. Gabbro (.....)
- 8. Quartzite (.....)
- 9. Sandstone (.....)

4 The following figure shows the formation of some rocks through chemical weathering, answer:

- 1. What is the name of weathering?
.....
- 2. Mention how it occurs.
.....
.....



5 What are the rocks that can be transformed from one type to another?
.....
.....

6 What are the geological processes that occur to form rocks over the ages?
.....
.....

7 Compare between each the following:

- 1. Sedimentary, metamorphic, and igneous rocks, in terms of: Method of formation – Examples.

P.O.C	Sedimentary rocks	Metamorphic rocks	Metamorphic rocks
a. Method of formation

b. Examples



2. Plutonic and surface igneous rocks, in terms of: Method of formation – Crystal size – Examples.

P.O.C	Plutonic igneous rocks	Surface igneous rocks
a. Method of formation
b. Crystal size
c. Examples

8 What is meant by each of the following:

1. Rocks

.....

2. Weathering

.....

.....

3. Mechanical weathering

.....

.....

4. Chemical weathering

.....

.....

5. Erosion

.....

.....

6. Lithification

.....

.....



7. Sediments

.....

.....

8. Sedimentary rocks

.....

.....

9. Magma

.....

.....

10. Lava

.....

.....

11. Rock cycle

.....

.....

12. Fossil fuel

.....

.....

9 State the importance of:

1. Marble

.....

.....

2. Limestone rock powder

.....

.....

10 Give reasons for:

1. Yellowstone National Park is an example of chemical weathering.

.....

.....



2. The water coming from Ethiopia appears brown.

.....

.....

3. Erosion is both a beneficial and harmful process for the environment.

.....

.....

.....

4. Sedimentary rocks are characterized by being porous.

.....

.....

5. Sedimentary rocks are characterized by the presence of fossil.

.....

.....

6. The crystals of surface igneous rocks are small.

.....

.....

7. The crystals of plutonic igneous rocks are large.

.....

.....

11 What happens when:

1. A glass bottle of water is filled to its top and placed in the refrigerator for several hours?

.....

2. Water freezes in the cracks between the rocks?

.....

.....



3. Water flows between rocks?

.....

.....

4. The temperature of the minerals that make up the rock rises during the day?

.....

.....

5. The temperature of the minerals that make up the rock decreases at night?

.....

.....

6. Plant roots grow within the cracks between rocks?

.....

.....

7. We add drops of hydrochloric acid to a piece of limestone?

.....

.....

8. We bring a matchstick close to the gas produced by adding acid to the limestone?

.....

.....

9. Limestone rocks are exposed to heat and pressure?

.....

.....

10. Magma comes out to the Earth's surface?

.....

.....

11. Magma interferes between the cracks and layers of the Earth?

.....

.....



12 What is the name of each figure?



1



2



3



4



5



6



7



8

Pony Revision on Unit 1 – Lesson 1

Metals and Nonmetals

First Week

1 Complete the following sentences:

1. The outermost energy level of metals contains less than four electrons, while that of nonmetals contains more than four electrons.
2. Element (A), with its outermost energy level (M) containing two electrons, is a metal, while element (B), with its outermost energy level (L) containing six electrons, is a nonmetal.
3. All metals are solids, except for mercury, which is a liquid.
4. All nonmetals are bad conductors of electricity, except for carbon (graphite), which is a good conductor of electricity.
5. Some nonmetals are solid materials, such as carbon; gaseous materials, such as nitrogen; and the only liquid is bromine.
6. The atoms of solid metals are arranged in a structure known as crystal lattice.
7. The metallic bond is formed due to the attraction between the positive ions of a metal and the cloud of valence negative electrons surrounding it.
8. The bronze alloy is composed of tin at 5% and copper at 95%.
9. The bronze alloy is used in manufacturing medals and jewelry.
10. The bronze alloy is characterized by being harder than copper and resistant to rust.

2 Cross out the odd word, and then write the relation between the remaining words:

1. Gold – Silver – Bromine – Mercury (Bromine)
(They are metallic elements.)
2. Phosphorus – Bromine – Mercury – Sulfur (Mercury)
(They are nonmetallic elements.)
3. Graphite – Bromine – Phosphorus – Sulfur (Graphite)
(They are bad electric conductors.)
4. Iodine – Sulfur – Carbon – Hydrogen (Hydrogen)
(They are solid nonmetallic elements.)
5. Bronze – Chlorine – Copper – Tin (Chlorine)
(They are metals or alloys containing metals)

3

1. Phosphorus and iron, in terms of:

- a.** Metallic luster **b.** Malleable and ductile
c. Conductivity of heat and electricity **d.** Melting point

P.O.C	Phosphorus	Iron
a. Metallic luster	It has no metallic luster.	It has a metallic luster.
b. Malleable and ductile	It is not malleable or ductile.	It is malleable and ductile.
c. Conductivity of heat and electricity	It is a bad conductor of heat and electricity.	It is a good conductor of heat and electricity.
d. Melting point	It has a low melting point.	It has a high melting point.

2. Sodium and graphite, in terms of:

- a.** Metallic luster

P.O.C	Sodium	Graphite
a. Metallic luster	It has a metallic luster.	It has no metallic luster.
b. Which one is opaque?	Shiny	Opaque

3. Sulfur and copper, in terms of:

- a.** Malleable and ductile **b.** Which one is more brittle?

P.O.C	Sulfur	Copper
a. Malleable and ductile	It is not malleable or ductile.	It is malleable and ductile.
b. Which one is more brittle?	Brittle	Hard

4. Silver and phosphorus, in terms of:

Conductivity of electric current

P.O.C	Silver	Phosphorus
Conductivity of electric current	It is a good conductor of electricity.	It is a bad conductor of electricity.



4 What is meant by each one of the following:

1. Metallic bond

It is the attraction force between the positive metal ions and the cloud of negative valence electrons surrounding them.

2. Alloy

It is a mixture that is composed of two or more molten metals.

3. Recycling

It is the process of conversion of the wastes into new usable substances.

5 What is the benefit of recycling metal wastes?

Recycling metals is much cheaper and easier than extracting them from their ores.

6 If elements (A & B) have melting points of (1538 & 115.21) respectively, answer the following questions:

1. What is the type of each one of them? And why?

- Element (A) is a metal because it has a high melting point.**
- Element (B) is a nonmetal because it has a low melting point.**

2. Which one of them is malleable and ductile?

- Element (A) is malleable and ductile because it is a metal.**

7 What happens if

1. We knock on a piece of graphite?

- The piece of graphite breaks off easily because graphite is a brittle nonmetal.**

2. We increase the number of valence electrons in the metal atoms according to the metallic bond?

- The strength of the metallic bond increases.**

3. We mix molten gold with molten copper?

- An alloy, which has different properties than gold and copper, is formed.**





8 Give reasons for the following:

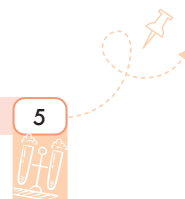
- Calcium ($_{20}\text{Ca}$) is a metal, while Chlorine ($_{17}\text{Cl}$) is a nonmetal.
 - Calcium ($_{20}\text{Ca}$) is a metal because it has 2 electrons in its last energy level.
 - Chlorine ($_{17}\text{Cl}$) is a nonmetal because it has 7 electrons in its last energy level.
- Carbon is used in the manufacture of dry cells although it is a nonmetal.
 - Because carbon is a good conductor of electricity.
- Calcium ($_{20}\text{Ca}$) is harder than sodium ($_{11}\text{Na}$).
 - Because the metallic bond in calcium is stronger than that in sodium, as calcium has two valence electrons, while sodium has one valence electron only.
- A bronze alloy is used in the manufacture of medals instead of copper.
 - Because a bronze alloy is harder than copper and it doesn't rust.

9 Complete the following table that shows some materials & their properties.

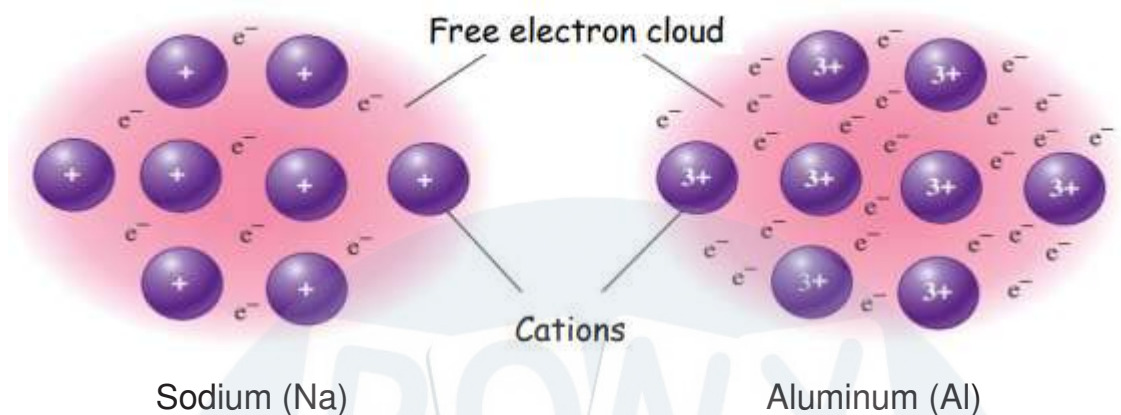
You can choose the color from the following words bank:

(Black - Colorless - Yellow - Waxy white - Silver - Red)

Element	Type	Physical State	Electric Conductivity	Color
1- Oxygen	Nonmetal	Gas	Bad conductor	Colorless
2- Gold	Metal	Solid	Good conductor	Yellow
3- Carbon	Nonmetal	Solid	Good conductor	Black
4- Bromine	Nonmetal	Liquid	Bad conductor	Red
5- Nitrogen	Nonmetal	Gas	Bad conductor	Colorless
6- Mercury	Metal	Liquid	Good conductor	Silver
7- Phosphorus	Nonmetal	Solid	Bad conductor	Waxy White



10 The following figure shows a bond between two different elements:



1. What are the types of the two elements in the figure? And why?
 - **The two elements are metals.**
 - **Because they have less than four electrons in their last energy levels.**
2. What is the valency of each?
 - **Sodium (Na) is monovalent +1**
 - **Aluminum (Al) is trivalent +3**
3. What is the type of bond in both of them?
 - **Metallic bond**
4. Which is stronger in terms of the bond? And why?
 - **The metallic bond in aluminum is stronger than that in sodium.**
(Aluminum has three valence electrons, while sodium has only one valence electron, so aluminum's metallic bond is stronger than sodium's metallic bond.)

Pony Revision on Unit 1 – Lesson 2

Acids and Alkalis

Second and
Third Weeks

1 Complete the following sentences:

1. The scientist Arrhenius clarified that acids are substances that dissolve in water and produce positive hydrogen ions, while bases, when dissolved in water, produce negative hydroxide ions.
2. The molecular formula of the carbonate group is CO_3^{-2} , while the molecular formula of the sulphate group is SO_4^{-2} .
3. Oxygenated acids are those that contain oxygen element, such as sulphuric acid and nitric acid.
4. Non-oxygenated acids don't contain oxygen element, such as hydrochloric acid and hydrobromic acid.
5. The number of hydrogen atoms in an acid molecule is equal to the charge of the anion that forms it.
6. The number of hydroxide groups in a base molecule equals the charge of the cation that forms it.
7. Lactic acid provides the muscles with energy during a lack of oxygen, and its accumulation in the muscles causes muscle cramps.
8. The molecular formula of acids starts with a positive hydrogen cation, and their names are associated with the anion in their composition.
9. The molecular formula of alkalis (bases) ends with a hydroxide group, and their names are associated with the cation in their composition.
10. The molecular formula of alkalis (bases) that contain a cation Ca^{+2} is $\text{Ca}(\text{OH})_2$.
11. The total charge of molecules of any compound equals zero.
12. The stomach secretes hydrochloric acid, which helps in food digestion.
13. Lemon and ketchup are considered acidic substances, while toothpaste and baking soda are considered alkaline substances.
14. When hydrochloric acid dissolves in water, it produces a positive Hydrogen (H^+) ion and a negative chloride (Cl^-) ion.

15. When magnesium hydroxide dissolves in water, it forms a positive magnesium ion and a negative hydroxide ion.
16. Acids react with alkalis to form salt and water.
17. Nitric acid is considered from strong acids, while nitrous acid and sulfurous acid are considered from weak acids.
18. Metals burn in the presence of oxygen gas, forming metal oxides, and most of them are known as basic oxides.
19. Nonmetals burn in the presence of oxygen gas, forming nonmetal oxides, and most of them are known as acidic oxides.
20. The dissolution of sulphur trioxide (SO_3) in water forms sulphuric acid H_2SO_4 .
21. Dissolving magnesium oxide (MgO) in water forms magnesium hydroxide.
22. The combustion of fossil fuels produces oxides of SO_2 and NO_2 .

2 How to differentiate between:

1. The bicarbonate group and the sulphate group, in terms of the number of charges they carry - the molecular formula.

P.O.C	Bicarbonate group	Sulphate group
a. The number of charges they carry	One negative charge	Two negative charges
b. The molecular formula	HCO_3^-	SO_4^{2-}

2. Sulphuric acid and calcium hydroxide, in terms of the molecular formula.

P.O.C	Sulphuric acid	Calcium hydroxide
The molecular formula	H_2SO_4	$\text{Ca}(\text{OH})_2$

3. Sulphurous acid and sulphuric acid, in terms of the molecular formula.

P.O.C	Sulphurous acid	Sulphuric acid
The molecular formula	H_2SO_3	H_2SO_4

4. Acidic oxides and basic oxides,
according to the definition - the result of their dissolution in water.

P.O.C	Acidic oxides	Basic oxides
a. Definition	They are nonmetal oxides that dissolve in water, forming acids.	They are metal oxides that dissolve in water, forming alkalis.
b. The result of their dissolution in water	Acids	Alkalis

5. Sulphurous acid and sulphuric acid,
according to the molecular formula - strength and weakness.

P.O.C	Sulphurous acid	Sulphuric acid
a. The molecular formula	H₂SO₃	H₂SO₄
b. Strength and weakness	Weak acid	Strong acid

3 Give one example of each of the following:

- A positive atomic group.
Ammonium atomic group (NH₄⁺)
- A non-oxygenated acid that forms an anion in a liquid state.
Hydrochloric acid (HCl)
- An acid secreted by the stomach.
Hydrochloric acid (HCl)
- An oxygenated acid that carries three negative charges.
Phosphoric acid (H₃PO₄)
- An acid secreted by the muscles.
Lactic acid
- A weak acid.
Nitrous acid (HNO₂)
- A strong acid.
Hydrochloric acid (HCl)

8. A strong alkali.

Sodium hydroxide (NaOH)

9. A weak alkali.

Ammonium hydroxide (NH₄OH)

10. A metallic oxide.

Magnesium oxide (MgO)

11. A non-metallic oxide.

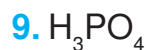
Sulphur trioxide (SO₃)

4 Write the chemical formula for the following compounds:

1. Hydrosulphuric acid (**H₂S**)
2. Hydrobromic acid (**HBr**)
3. Sulphurous acid (**H₂SO₃**)
4. Phosphoric acid (**H₃PO₄**)
5. Ammonium hydroxide (**NH₄OH**)
6. Hydrochloric acid (**HCl**)
7. Sulphuric acid (**H₂SO₄**)
8. Nitric acid (**HNO₃**)
9. Potassium hydroxide (**KOH**)
10. An atomic group consisting of three elements (**HCO₃**)
11. Nitrous acid (**HNO₂**)

5 Write the names of the following chemical compounds and state their type:

1. H₂SO₄ (**Sulphuric acid**) (**Oxyacid**)
2. H₂CO₃ (**Carbonic acid**) (**Oxyacid**)
3. HCl (**Hydrochloric acid**) (**Acid that doesn't contain oxygen**)
4. HNO₂ (**Nitrous acid**) (**Oxyacid**)
5. MgO (**Magnesium oxide**) (**Basic oxide**)
6. SO₃ (**Sulphur trioxide**) (**Acidic oxide**)
7. Mg(OH)₂ (**Magnesium hydroxide**) (**Alkali**)
8. H₂S (**Hydrosulphuric acid**) (**Acid that doesn't contain oxygen**)



(Phosphoric acid) (Oxyacid)



(Sodium chloride) (Salt)

6 What is meant by each of the following:**1. Atomic group**

It is an ion composed of more than one atom of more than one element.

2. Acids

They are substances that dissolve in water and give positive hydrogen ions H^+ .

3. Alkalis

They are substances that dissolve in water and give negative hydroxide ions OH^- .

4. Acidic oxides

They are nonmetal oxides that dissolve in water, forming acids.

5. Basic oxides

They are metals oxides that dissolve in water, forming alkalis.

6. Acid rains

They are rains resulting from the dissolution of acidic oxides in the water vapor of the atmosphere.

7 What is the benefit of each of the following:**1. Stomach acid**

It participates in the food digestion.

2. Lactic acid

It provides the muscle with oxygen when oxygen is lacking.

3. Milk of magnesia

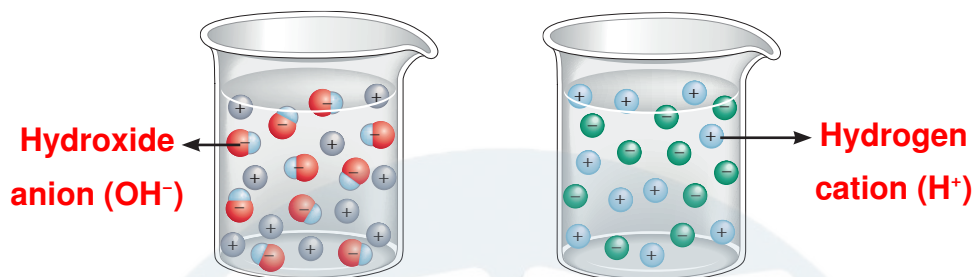
To neutralize gastric acidity as it contains magnesium hydroxide.

4. Litmus paper

To differentiate between acids and alkali, as acids turn the litmus strip into red, while alkalis turn the litmus strip into blue.

8 Study the following figures, and then answer the questions below:

The two figures show two compounds, one alkaline and the other acidic.



1. Which is acidic and which is alkaline?

Compound (1) is acidic, while compound (2) is alkaline.

2. Which of them results from the dissolution of a nonmetal and which results from the dissolution of a metal?

1. An acidic compound results from the dissolution of a nonmetal.

2. An alkaline compound results from the dissolution of a metal.

3. What is the result of adding the first tube to the second tube?

Salt and water are formed

4. How do you differentiate between them with a litmus strip?

Compound (1) turns the blue litmus strip into red.

Compound (2) turns the red litmus strip into blue.

9 Study the following figures, and then answer the questions below:

The two opposite figures show two alkali compounds, which are sodium hydroxide and ammonium hydroxide.

1. Write the chemical formula for each of them.

Sodium hydroxide $\rightarrow \text{NaOH}$

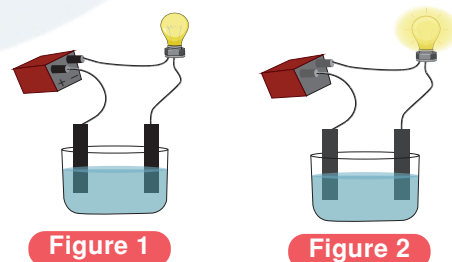
Ammonium hydroxide $\rightarrow \text{NH}_4\text{OH}$

2. Which one of them is weakly alkaline? And why?

Figure 1 (ammonium hydroxide) because a weak alkali doesn't conduct electricity well.

3. Which one of the two figures represents (NaOH)?

Figure (2)



10 Study the following figures, and then answer the questions below:

The two figures show the combustion of two elements:



**Combustion of a
magnesium ribbon**



**Combustion of sulphur
crystals**

1. Which is a metal and which is a nonmetal?

Magnesium is a metal, while sulphur is a nonmetal

2. What is the result of combustion of each of them?

- **The combustion of magnesium produces magnesium oxide (MgO).**
- **The combustion of sulphur produces sulphur trioxide (SO₃).**

3. How do we differentiate between them through practical experience?

- **When magnesium oxide dissolves in water, it forms an alkali, which turns the red litmus strip into blue.**
- **When sulphur trioxide dissolves in water, it forms an acid, which turns the blue litmus strip into red.**

11 Give reasons for the following:

1. Acids turn the blue litmus paper into red.

- **Because acids dissolve in water, giving a hydrogen cation H⁺.**

2. Alkalis turn the red litmus paper into blue.

- **Because alkalis dissolve in water, giving a hydroxide anion OH⁻.**

3. Milk of magnesia is used to treat stomach acidity.

- **To neutralize the gastric acidity, as it contains Mg(OH)₂.**



12 What happens when:

1. An electric current passes through sulphuric acid and acetic acid, according to the lighting of the lamp?

Sulphuric acid is a strong acid, so the light of the lamp will be strong, while acetic acid is a weak acid, so the light of the lamp will be weak.

2. Acids are mixed with alkalis?

Salt and water are formed.

3. You heat a piece of magnesium, and then add water to the product?

Magnesium oxide (MgO) is formed, which dissolves in water giving magnesium hydroxide $Mg(OH)_2$.

4. You heat a piece of sulphur? سلسلة كتب الأستاذ

Sulphur trioxide (SO_3) is formed.

5. You add water to the previous product?

Sulphuric acid (H_2SO_4) is formed.

6. You put a blue litmus paper in the previous solution?

The litmus paper will turn into red.

7. Sulphur oxide is dissolved in rain water? سلسلة كتب الأستاذ

Acid rain is formed.

13 Mention the damages caused by acid rains.

1. Destruction of forests.
2. Harming aquatic organisms.
3. Harming the respiratory system.
4. Corrosion of buildings.



Pony Revision on Unit 1 – Lesson 3

Chemical Indicators and Salts

Fourth Week

1 Complete the following sentences:

1. Chemical indicators are chemical substances that change their color in an acidic medium compared to a basic medium, such as litmus indicator.
2. Distilled water has a neutral effect and does not change the color of the litmus strip due to the equal number of H^+ ions with OH^- ions.
3. There are many indicators, such as litmus strip and universal indicator.
4. We reduce soil acidity by adding basic materials, such as calcium hydroxide $Ca(OH)_2$.
5. The pH value of acids is less than 7, while the pH value of bases is greater than 7.
6. The pH value of a table salt solution (sodium chloride) is seven.
7. The pH value is accurately measured by using a device called pH meter.
8. Acidic gases include carbon dioxide (CO_2) and nitrogen dioxide (NO_2).
9. Basic gases include ammonia gas (NH_3).
10. Neutral gases, which do not affect a litmus strip, include hydrogen gas (H_2) and oxygen gas (O_2).

2 Cross out the odd word, and then write the relation between the remaining words:

1. Universal indicator strips – Litmus paper – Voltmeter – pH meter
(**Voltmeter**)
(The others are chemical indicators.)
2. N_2 – H_2O – H_2 – HCl (HCl)
(The others have neutral effect on the litmus strip.)
3. SO_2 – Cl_2 – CO_2 – NH_3 (NH_3)
(The others are acidic gases.)
4. HNO_3 – H_2SO_4 – H_2O – HCl (HCl)
(The others are acids.)

3 How do you differentiate between each of the following:

1. Distilled water and hydrochloric acid in two ways

P.O.C	Distilled water	Hydrochloric acid
a. By litmus indicator	It doesn't change the color of the litmus strip.	It turns the color of the blue litmus strip into red.
b. By pH meter	The pH value equals seven.	The pH value is less than seven.

2. CO₂ and O₂ gases

P.O.C	CO ₂	O ₂
a. By a wet litmus strip	It turns the color of the blue litmus strip into red.	It doesn't change the color of the litmus strip.

3. Ammonia gas and nitrogen dioxide gas

P.O.C	Ammonia gas	Nitrogen dioxide
a. By a wet litmus strip	It turns the color of the red litmus strip into blue.	It turns the color of the blue litmus strip into red.

4 Give one example of each of the following:

- | | |
|--|---------------------------|
| 1. A gas that turns the blue litmus strip into red. | Carbon dioxide gas |
| 2. A gas that turns the red litmus strip into blue. | Ammonia gas |
| 3. A gas that has a neutral effect on the litmus paper. | Hydrogen gas |
| 4. A chemical indicator that measures the pH accurately. | pH meter |

5 What is meant by each one of the following:

1. Indicators

They are chemical substances whose color differ in the acidic medium from the alkaline medium.

2. Universal indicator

It is a chemical indicator that can be used to distinguish between acids and alkalis, acids and each other, or alkalis and each other according to their strength.

3. pH value

It is a scale ranging from 0 to 14 that indicates the acidity or the basicity of a solution.

6 Answer the following questions:

1. If you have nitric acid and nitrous acid:

- 1 Write their molecular formula.

Nitric acid $\rightarrow \text{HNO}_3$

Nitrous acid $\rightarrow \text{HNO}_2$

- 2 Which one is strong and which one is weak?

Nitric acid is a strong acid, while nitrous acid is a weak acid.

- 3 How do you differentiate between them?

By measuring the pH value of them using a pH meter device, the pH value of nitrous acid is more than that of nitric acid.

2. If you have two compounds (A) & (B) and their pH values are (8.5 and 3) respectively:

- 1 Determine the type of each one.

Compound (A), with pH value 8.5, is a base (alkali), while compound (B), with pH value 3, is an acid.

- 2 What happens when you mix them together?

They will produce salt and water.

7 Give reasons for the following:

1. Litmus paper is not suitable for distinguishing between strong and weak acids.

Because the litmus strip gives the same color with both of them.

2. Litmus paper doesn't affect distilled water.

Because distilled water is a neutral solution, as the number of cations of H^+ equals the number of anions of OH^- .



3. Nitric acid turns the blue litmus paper into red.

Due to the presence of hydrogen cations (H^+).

4. Calcium hydroxide turns the red litmus paper into blue.

Due to the presence of hydroxide anions (OH^-).

8 What happens in each one of the following:

1. You put a piece of sugar in a test tube containing sulphuric acid?

The sugar becomes black (charred).

2. You place two red and blue litmus strips in a tube of hydrogen gas?

The colors of the two wet litmus strips don't change.

3. You place two red and blue litmus strips in a tube containing chlorine gas?

The color of the two wet litmus strips is removed.

4. You place two red and blue litmus strips in a tube containing carbon dioxide gas?

- The color of the blue wet litmus changes into red.

- The color of the red wet litmus does not change.

5. You place two red and blue litmus strips in a tube containing ammonia gas?

- The color of the blue wet litmus does not change.

- The color of the red wet litmus changes into blue.

6. You add calcium hydroxide to acidic soil?

Calcium hydroxide is an alkaline substance, so it will treat and reduce the soil acidity.



Pony Revision on Unit 2

Energy and Its Applications

Sixth and
Seventh Weeks

1 Complete the following sentences:

Lesson 1: Potential Energy

- Meter and kilometer are the measuring units of distance and displacement.
- km/h and m/s are the measuring units of speed.
- Speed = $\frac{\text{Distance}}{\text{Time}}$
- Joule is the measuring unit of work, while newton is the measuring unit of force.
- Work = Force \times Displacement
- The factors affecting potential energy are weight and height.
- Newton is the measuring unit of weight.
- Five kilometers = 5000 meters, while three kilojoules = 3000 joules.

Lesson 2: Kinetic Energy

- The factors affecting the kinetic energy of an object are mass and speed.
- The measuring unit of kinetic energy is joule and is equal to kg x (m/s)².
- The kinetic energy of an object = $\frac{1}{2} m \times v^2$.
- Kinetic energy is directly proportional to mass and square of speed.
- The more the mass of the object, the slower the speed when the kinetic energy is constant.
- If the speed of the body increases into three times, its kinetic energy increases into 9 times of its value.

2 Choose from columns (B) and (C) what suits column (A):

Lesson 1: Potential Energy

Column (A)	Column (B)	Column (C)
1. Work	1. m/s	1. $w \times h$
2. Potential energy	2. N	2. $F \times s$
3. Weight	3. J	3. $m \times g$
4. Speed	4. N.m	4. $d \div t$
1. 3, 2 2. 4, 1	3. 2, 3 4. 1, 4	

3 Complete the following table:**Lesson 2: Kinetic Energy**

Number	Kinetic Energy (KE) (Joules)	Speed (v) (m/s)	Mass (m) (kg)
(1)	64	8	2
(2)	48	4	6
(3)	96	5.6	6

4 Compare between:**Lesson 2: Kinetic Energy**

Kinetic energy and potential energy in terms of:

Definition – mathematical relationship – affecting factors

Device	Kinetic Energy	Potential Energy
a. Definition	It is the gained energy by an object as a result of its motion.	It is the stored energy in the object as a result of the work done on it.
b. Mathematical Relationship	$KE = \frac{1}{2}mv^2$	$PE = mgh$
c. Affecting Factors	1- Object's mass 2- Object's speed	1- Object's weight 2- Object's height

5 What is meant by each of the following?**Lesson 1: Potential Energy****1. Movement path.**

It is a set of points that an object passes through during its movement.

2. Distance.

It is the total length of any path taken by the object during its motion from the starting point to the end point.

3. Displacement.

It is the shortest straight path connecting the starting point and the end point in a constant direction.



4. Speed.

It is the distance covered by a moving object per a unit of time.

5. Work.

It is the amount of energy required to move an object through a certain displacement in the same direction of the force that acts on it.

6. Energy.

It is the ability to do work.

7. Potential energy.

It is the stored energy in an object as a result of the work done on it.

8. The independent variable.

It is the variable that is changed during the experiment.

9. The dependent variable. سلسلة كتب الأستاذ

It is the variable to be tested, which changes in response to changing the independent variable.

10. Controlled variables.

They are the variables controlled to remain constant throughout the experiment.

Lesson 2: Kinetic Energy

11. Kinetic energy. سلسلة كتب الأستاذ

It is the gained energy by an object as a result of its motion.

Or

It is the work done during the motion of an object.

6 What is meant by:

Lesson 1: Potential Energy

1. The distance traveled by an object is 50 meters.

This means that the total length of the path taken by the object during its motion from the starting point to the end point equals 50 meters.

2. The displacement of a body is 30 meters.

This means that the length of the shortest straight path connecting between the starting and the end point in a constant direction equals 30 meters.





3. A body's speed is 120 km/h.

This means that this body covers a distance of 120 km in one hour.

4. A moving car travels 720 meters in two minutes.

This means that the speed of this car equals 6 m/s.

$$V = \frac{d}{t} = \frac{720}{2 \times 60} = 6 \text{ m/sec}$$

5. The potential energy of a body is 60 joules.

This means that the energy stored in the body as a result of the work done equals 60 joules.

6. The energy stored in a body as a result of the work done is 0.5 kilojoules.

This means that the potential energy equals 500 Joules.

Lesson 2: Kinetic Energy

7. The kinetic energy of an object is 250 joules.

This means that the gained energy by the object as a result of its motion equals 250 joules.

7 What happens when:

Lesson 2: Kinetic Energy

1. The speed of a moving object increases into the double with a constant mass, according to its kinetic energy?

The kinetic energy will increase 4 times of its value.

2. The mass is doubled and the speed is decreased to half, according to the kinetic energy?

The kinetic energy will decrease to half of its value.

3. Two cars, (1) and (2), move at different speeds and have the same mass, according to the kinetic energy?

The two cars (1) and (2) will move with different kinetic energies.

8 When will the following happen?

Lesson 1: Potential Energy

1. The speed is equal to zero.

When the object is static (There is no distance covered by the object).



2. The work is equal to zero.

1) If the object doesn't move. (The displacement = zero).

2) If the direction of the acting force is opposite to the direction of the object's motion.

3. The potential energy equals zero.

When the object reaches the ground, as the height of the object equals zero.

4. The distance equals the displacement.

When the object moves in a straight line in one direction.

5. The speed equals the distance.

When the object covers this distance in a unit time (1 sec or 1 h).

Lesson 2: Kinetic Energy

6. The kinetic energy = zero.

When the object is static and its speed is zero.

7. The kinetic energy is numerically equal twice the mass of the body.

When the speed of the body is 2 m/s.

9 Give reasons for:

Lesson 1: Potential Energy

1. The work done by a car is less than the work done by a truck, even though their speeds are equal.

Because the mass of the truck is greater than the mass of the car.

2. The work required to stop a moving car at a high speed increases.

Because the car that moves at a high speed has a high kinetic energy.

Lesson 2: Kinetic Energy

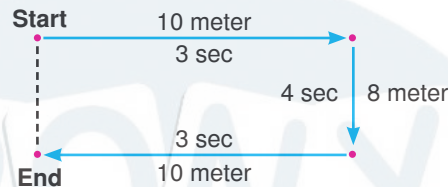
3. The kinetic energy of the car decreases when the driver presses the car's brakes.

Because when the driver presses the car's brakes, the speed of the car decreases.

10 Problems:

Lesson 1: Potential Energy

1. A body moves 10 meters east in 3 seconds, then moves 8 meters south in 4 seconds, then moves 10 meters west in 3 seconds. Calculate:
 - a. Total distance
 - b. Displacement
 - c. Body speed

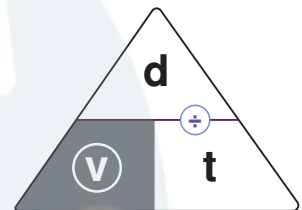


a. Total distance (d) = 10 + 8 + 10 = 28 m

b. Displacement (s) = 8 m

c. Time = 3 + 4 + 3 = 10 sec

$$v = \frac{d}{t} = \frac{28}{10} = 2.8 \text{ m/sec}$$



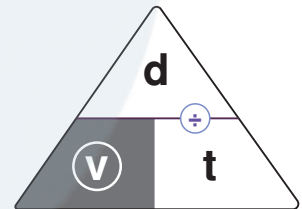
2. Calculate the speed of a body that covered a distance of 50 km in two hours.

d = 50 km

t = 2 h

v = ?

$$v = \frac{d}{t} = \frac{50}{2} = 25 \text{ km/h}$$



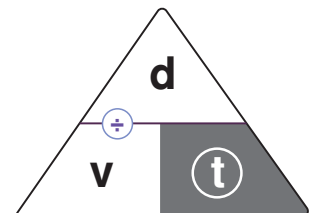
3. Calculate the time required to cover a distance of 300 meters if the body is moving at a speed of 20 m/s.

d = 300 m

v = 20 m/s

t = ?

$$t = \frac{d}{v} = \frac{300}{20} = 15 \text{ sec}$$



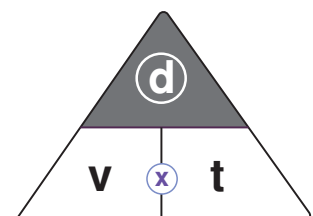
4. If a body moves at a speed of 20 km/h, calculate the distance traveled after three hours.

v = 20 km/h

t = 3 hours

d = ?

$$d = v \times t = 20 \times 3 = 60 \text{ km}$$



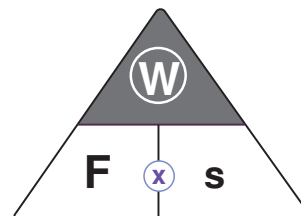
5. A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.

$$F = 40 \text{ N}$$

$$S = 10 \text{ m}$$

$$W = ?$$

$$W = F \times S = 40 \times 10 = 400 \text{ J}$$



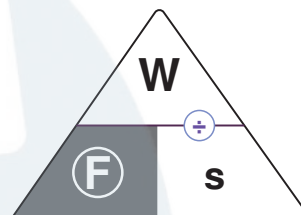
6. A body does work of 50 joules to move a bicycle a distance of 10 meters. Calculate the amount of force required to do the work.

$$W = 50 \text{ J}$$

$$s = 10 \text{ m}$$

$$F = ?$$

$$F = \frac{W}{s} = \frac{50}{10} = 5 \text{ N}$$



7. Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm, knowing that the acceleration due to gravity is 10 Newton/kg.

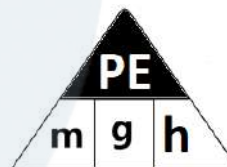
$$PE = ?$$

$$m = 15 \text{ kg}$$

$$g = 10 \text{ N/kg}$$

$$h = 1.5 \text{ m}$$

$$PE = m \times g \times h = 15 \times 10 \times 1.5 = 225 \text{ J}$$



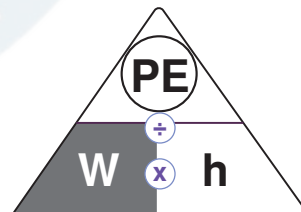
8. If a body has a potential energy of 240 joules at a height of 12 meters, calculate the weight of the body.

$$PE = 240 \text{ J}$$

$$h = 12 \text{ m}$$

$$W = ?$$

$$W = \frac{PE}{h} = \frac{240}{12} = 20 \text{ N}$$



Lesson 2: Kinetic Energy

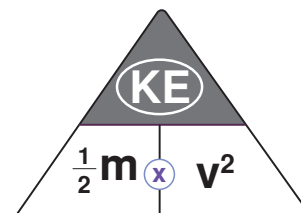
9. Calculate the kinetic energy of a ball with a mass of 20 kg moving at a speed of 4 m/s.

$$KE = ??$$

$$m = 20 \text{ kg}$$

$$v = 4 \text{ m/s}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 20 \times 4^2 = 160 \text{ J}$$



10. Calculate the kinetic energy of a body weighing 20 Newtons moving at a speed of 6 m/s.

$$w = 20 \text{ N}$$

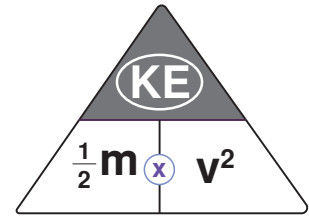
$$v = 6 \text{ m/s}$$

$$g = 10$$

$$w = m \times g$$

$$m = \frac{w}{g} = \frac{20}{10} = 2 \text{ kg}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 2 \times 36 = 36 \text{ J}$$



11. Calculate the kinetic energy of a body with a mass of 500 g that travels 20 meters in 4 seconds.

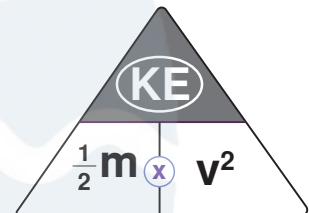
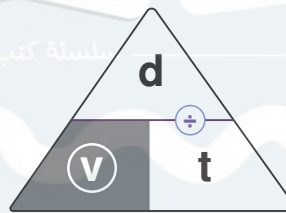
$$m = 500 \text{ g} = \frac{500}{1000} = 0.5 \text{ kg}$$

$$d = 20 \text{ m}$$

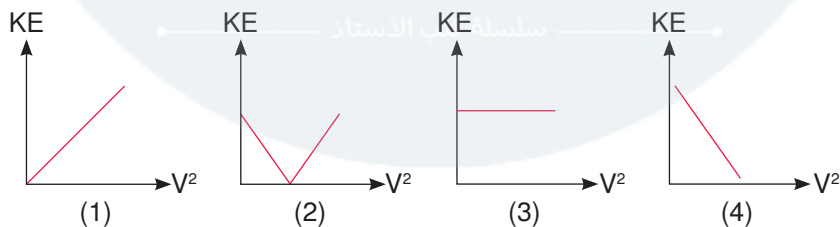
$$t = 4 \text{ s}$$

$$v = \frac{d}{t} = \frac{20}{4} = 5 \text{ m/s}$$

$$KE = \frac{1}{2} m \times v^2 = \frac{1}{2} \times 0.5 \times 5 \times 25 = 6.25 \text{ J}$$



12. The following figures show the relationship between kinetic energy and velocity when the mass is constant. Determine which of them represents:



1. Its kinetic energy increases. (1)
2. Its kinetic energy decreases. (4)
3. Its kinetic energy remains constant. (3)

Pony Revision on Unit 3 – Lesson 1

Nutritional Relationship in Biological Communities

Eighth and
Ninth Weeks

1 Complete the following sentences:

1. The ecosystem consists of living organisms and non-living things.
2. There are non-living components in the ecosystem, such as air and water.
3. The ecosystem consists of several levels: the individual, biotic population, and biological community.
4. Species is considered the basic unit in the classification of living organisms.
5. A commensal is the individual that benefits from commensalism.
6. A host is the one that is neither benefited nor harmed in commensalism.
7. Each stage in which energy is transferred in the food chain is called trophic level.
8. The rabbit and the horse are considered herbivores because they have incisors for cutting plants.
9. Carnivorous animals, such as lions and snakes, are characterized by having sharp canines to tear their prey.
10. Omnivorous animals, such as bears and mice, feed on both meat and plants.
11. Hyenas and vultures are considered scavengers as they feed on the remains of dead organisms.

2 What is meant by each of the following?

1. Ecosystem

It is an area that consists of living organisms and non-living components.

2. Biocommunity

It includes the various populations of different species that inhabit the same environment.

3. The individual

It is a single living organism that belongs to a specific species.



4. Predation

It is a nutritional relationship between two living organisms, one benefits (predator) and the other is harmed (prey).

5. Competition

It is a nutritional relationship between two individuals of the same species for a food source that is found in limited quantities, which negatively impacts their growth or survival.

6. Mutualism

It is a nutritional relationship between two individuals, both of them benefits from each other without causing harm to either of them.

7. Commensalism

It is a nutritional relationship between two individuals that benefits one organism, known as the commensal, while the other organism, known as the host, neither benefits nor is harmed.

8. Decomposers

They are living organisms that obtain their food from the dead bodies.

9. Food chain

It is the path of energy transfer in the form of food as it moves from one living organism to another within the ecosystem.

10. Food web

It is the interconnection and overlapping of multiple food chains.

11. Energy pyramid

It is a pyramid that represents the flow of energy and the amount of energy at each trophic level in a food chain.

12. Biological control

It is a food system that uses (utilizes) living organisms to eliminate agricultural pests instead of using pesticides

3 Mention the type of food relationship in each of the following:

1. The remora fish that sticks to the shark's body and gets its food remains without affecting the shark. **(Commensalism)**



2. Falcons hunt mice. (Predation)
3. The trees in the forest are densely packed together, blocking light from the short trees. (Competition)
4. Spiders hunt insects. (Predation)
5. Algae live inside the coral tissues and carry out photosynthesis, which provides food for corals, while corals get oxygen and nutrients. (Mutualism)
6. Lions compete for gazelles. (Competition)

4 What happens when:

1. Food sources lack in a balanced ecosystem?
The competition increases between the individuals of the same species, which negatively impacts their growth or survival.
2. Food shortage occurs for a group of hyenas?
The competition happens between them, which negatively impacts their growth or survival.
3. One of the living organisms present in a balanced ecosystem is absent?
The other living organisms in the food chain or the food web are affected, which causes an imbalance for the ecosystem.
4. The number of primary consumers increases?
 - The number of producers decreases.
 - The number of secondary consumers increases.
5. The number of secondary consumers decreases?
 - The number of primary consumers increases.
 - The number of tertiary consumers decreases.

5 Study the figures below, then answer the following questions:



(1)



(2)



(3)



(4)

- a.** Which of these creatures is a carnivore, omnivore, herbivore, or scavenger?

The lion is a carnivore, the bear is an omnivore, the horse is a herbivore, and the eagle is a scavenger.

- b.** Compare between the lion and the horse in terms of:
Type of food – Shape of the teeth

P.O.C	Lion	Horse
a. Type of Food	Animals (Meat)	Plants only
b. Shape of the Teeth	Sharp canines	Incisors

6 The following figure shows a living organism. Answer the questions below:

- a.** What is the name of this organism?

Dotted beetle (Lady bug)

- b.** What organisms does it feed on?

It feeds on aphid insects.

- c.** What is the benefit of this organism to the environment?

It is used to eliminate agricultural pests instead of using pesticides.





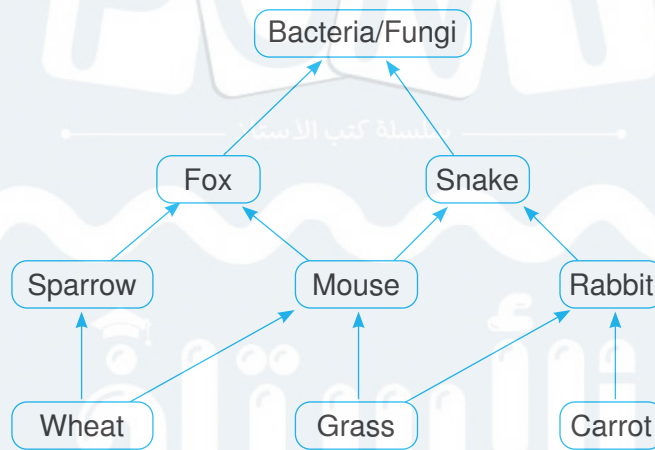
7 Create food chains and a food web from the following organisms:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Bacteria –
Fungi – Sparrow – Fox – Falcon – Snake – Fish – Bear – Algae – Lion

Food chains:

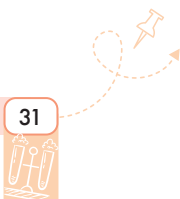
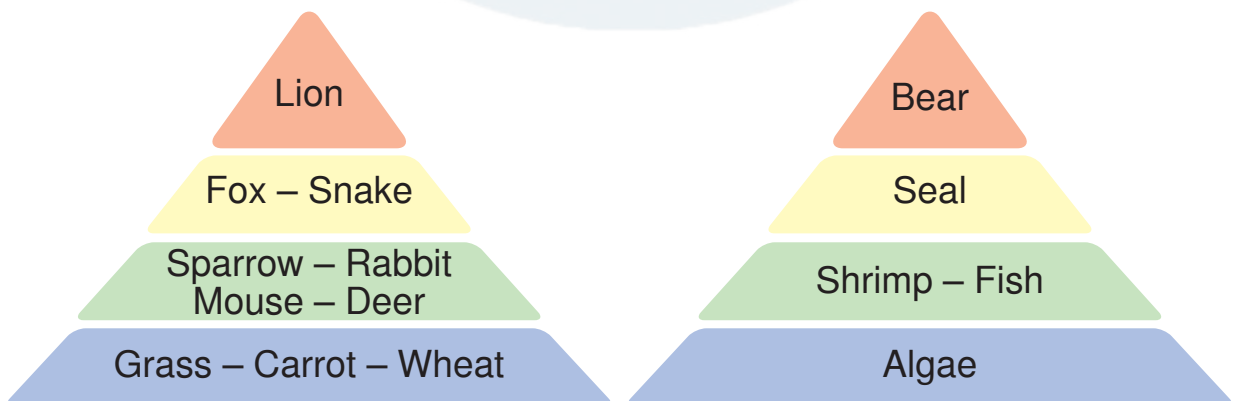
- 1) Carrot → Rabbit → Snake → Bacteria
- 2) Grass → Mouse → Snake → Bacteria
- 3) Wheat → Mouse → Fox → Bacteria
- 4) Algae → Shrimp → Fish → Seal → Bear → Fungi

Food web:



8 Create an energy pyramid from the following:

Carrot – Shrimp – Grass – Seal – Wheat – Deer – Mouse – Rabbit – Sparrow –
Fox – Falcon – Snake – Fish – Bear – Algae – Lion



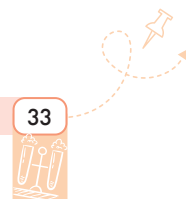
1 Put (✓) or (X):

1. Inherited traits are those passed from offspring to parents. (X)
2. The brown eye color is an acquired trait. (X)
3. The presence of a solid body structure covering the turtle is an inherited trait. (✓)
4. Instinctive behaviors are passed from parents to offspring without learning. (✓)
5. Acquired traits are not inherited and are acquired by humans from the environment. (✓)
6. Breastfeeding is an acquired trait. (X)
7. The genetic material is found in the cytoplasm of the eukaryotes. (X)
8. Chromosomes are thread-like bodies found inside the nucleus in the bean plant. (✓)
9. A chromosome consists of two strands, each of which is called a chromatid. (✓)
10. The number of chromosomes in humans is 46 chromosomes, and in corn is 32 chromosomes. (X)
11. The chromosome is chemically composed of DNA and protein. (✓)
12. DNA is made up of small parts known as nucleotides. (✓)
13. Spontaneous mutation occurs without human intervention. (✓)
14. Production of featherless chickens is considered induced mutation. (✓)
15. Scoliosis (spinal deformity) is a lethal mutation. (X)
16. Severe muscle atrophy and weakness is a lethal mutation. (✓)
17. The light skin color of people living in cold regions is a beneficial mutation. (✓)
18. Production of cube-shaped watermelons is an example of induced mutations. (X)
19. People who suffer from lactose intolerance experience cramps and nausea when they eat meat. (X)
20. Beneficial mutations cause the appearance of desirable traits. (✓)



2 Complete the following sentences:

1. The genetic material is found in the cytoplasm of prokaryotic organisms, and in the nuclei of eukaryotic organisms.
2. Examples of hereditary traits in humans are eye colors and hair colors.
3. Examples of acquired traits in humans are learning languages and learning to walk.
4. A hen sitting on eggs is an example of a/an instinctive behavior, while a dolphin playing with a ball is a/an acquired trait.
5. Chromosomes are found in a thread shape inside the nucleus.
6. Genetic traits are passed from parents to offspring through chromosomes.
7. A chromosome is made up of two chromatids connected at the centromere.
8. The chromosome chemically consists of nucleic acid and a protein known as histones.
9. DNA is made up of small units called nucleotides.
10. Each gene consists of smaller units called nucleotides.
11. Nucleotides exist in the form of two strands twisted around each other, and the two strands are called double helix.
12. Each chromosome carries thousands or millions of genes, which vary in number from one chromosome to another in the cells of the same individual.
13. The mixture used in separating a strawberry chromosome consists of dishwashing liquid and table salt with water.
14. Mendel is considered the founder of genetics, and he conducted his experiments on the pea plant.
15. The scientists Beadle and Tatum arrived at a working hypothesis for expressing genetic traits and it is known as one gene – one enzyme.
16. Genes produce enzymes, which are responsible for a chemical reaction that leads to the formation of protein, showing the genetic trait.
17. Spinal curvature is a result of harmful mutations, while muscular dystrophy is a result of lethal mutations.





18. The production of seedless lemons is a result of **beneficial** mutations.

3 Give one example of each of the following:

1. A hereditary trait in humans. (Eye colors – Hair colors)
2. An acquired trait in a horse. (A horse jumping over obstacles)
3. An instinctive behavior in a chicken. (A chicken incubating its eggs)
4. A spontaneous mutation in humans. (Albino child)
5. An induced mutation in chickens. (Featherless chicken)
6. A beneficial mutation in humans. (Light skin color in individual in cold regions)
7. A fatal (lethal) mutation in humans. (Muscular dystrophy)
8. A harmful mutation in humans. (Spinal deformity)
9. An alternative to butter for a person suffering from lactose intolerance. (Olive oil)
10. An alternative to milk for a person suffering from lactose intolerance. (Soya milk)
11. An alternative to chocolate milk for a person suffering from lactose intolerance. (Dark chocolate)

4 Classify the following as hereditary traits, acquired traits, or instinctive behaviors:

1. Reading and writing (Acquired traits)
2. The length of a giraffe's neck (Hereditary traits)
3. The squirrel breaking the shell of a nut (Instinctive behaviors)
4. Learning to swim (Acquired traits)
5. The spider weaving its net (Instinctive behaviors)
6. The short legs of the Arctic fox (Hereditary traits)
7. Learning Hindi (Acquired traits)
8. Birds incubating eggs (Instinctive behaviors)
9. Horses jumping hurdles (Acquired traits)



10. Facial freckles (Hereditary traits)
11. Breastfeeding (Instinctive behaviors)
12. Blood type (Hereditary traits)
13. The dolphin playing with a ball (Acquired traits)
14. The bat sleeping upside down (Instinctive behaviors)
15. Hair color (Hereditary traits)

5 Compare between:

1. Hereditary traits and acquired traits, in terms of: Definition – Examples

P.O.C	Hereditary Traits	Acquired Traits
a. Definition	They are traits transmitted from parents to offspring without learning.	They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training.
b. Examples	<ul style="list-style-type: none"> - Eye colors - Hair colors 	<ul style="list-style-type: none"> - Learning languages - Learning to walk

2. Acquired traits and instinctive behaviors, in terms of: Definition – Examples

P.O.C	Acquired Traits	Instinctive Behaviors
a. Definition	They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training	They are behaviors and skills that are transmitted from parents to offspring without learning.
b. Examples	<ul style="list-style-type: none"> - Learning languages - Learning to walk 	<ul style="list-style-type: none"> - A bat sleeping upside down - A bird building its nest

3. Spontaneous mutation and induced mutation in terms of: Definition -

Examples

P.O.C	Spontaneous Mutation	Induced Mutation
a. Definition	It occurs naturally, without human intervention.	It occurs through human intervention.
b. Examples	Albino child	Featherless chicken

4. Harmful mutation and lethal mutation in terms of examples

P.O.C	Harmful Mutation	Lethal Mutation
Examples	Spinal deformity (curved spine)	Muscular dystrophy

6 What is meant by each of the following?

1. Genetics

It is the science that studies the transmission of genetic traits from parents to offspring.

2. Inherited traits

They are traits transmitted from parents to offspring without learning.

3. Instinctive behaviors

They are behaviors and skills that are transmitted from parents to offspring without learning.

4. Acquired traits

They are traits that are not inherited from parents, but are acquired from the surrounding environment through learning or training.

5. Chromosomes

They are thread-like bodies that represent the genetic material of living organisms.

6. Centromere

It is a central point that connects the two chromatids of the chromosome together.

7. Mutation

It is the emergence of new hereditary trait that did not previously

exist, resulting from a change in the nature of the responsible gene.

8. Spontaneous mutations

They are mutations that occur naturally, without human intervention.

9. Induced mutations

They are mutations that occur through human intervention.

7 Give reasons for:

1. The genes found on a single chromosome are different.

Due to the difference in the sequence of nucleotides in the DNA.

2. DNA is known as a double helix.

Because the genes are arranged in the form of two strands twisted around each other, forming double helix.

3. Smooth hair is considered a hereditary trait, while learning to swim is an acquired trait.

Because smooth hair is a trait that is transmitted from parents to offspring without learning, while learning to swim is not inherited from parents, but is acquired through learning or training.

4. A squirrel breaking a nut is considered an instinctive behavior.

Because it is a behavior that is transmitted from parents to offspring without learning.

5. Mendel is considered the founder of genetics.

He concluded that each hereditary trait is controlled by a pair of genetic factors, known as genes.

6. Genes are considered responsible for the appearance of hereditary traits.

Each gene produces an enzyme that is responsible for the occurrence of a chemical reaction, leading to the formation of a protein that expresses a specific hereditary trait.

7. A dark-skinned mother giving birth to an albino child is considered a spontaneous mutation.

Because it occurs naturally without human intervention.

8. Light skin color in people living in cold regions is a beneficial spontaneous mutation.

Because it is a mutation that occurs naturally, which helps them to absorb vitamin D better.

9. Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.

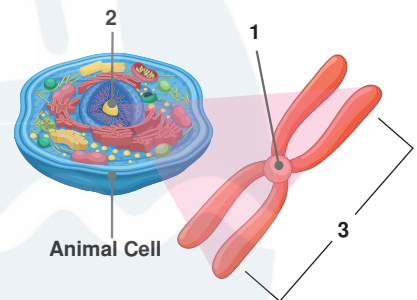
Because watermelons are placed in a square mold during its growth to facilitate its transportation.

10. Lactose tolerance is considered a beneficial mutation.

Because they can convert lactose sugar into simple sugars, which are easier for the body to absorb.

8 Complete the data on the drawing:

1. Centromere
2. Nucleus
3. Chromosomes



Determine the location of number (3) in bacteria and rabbits.

- In bacteria, chromosomes are found in the cytoplasm.
- In rabbits, chromosomes are found in the nucleus.

9 What are the consequences of:

1. A difference in the order of nucleotides in a single chromosome?

This results in a change in the nature of the gene, leading to a change in the hereditary trait and the emergence of a new trait that did not previously exist known as mutation.

2. The formation of genes for certain enzymes?

- Each gene produces an enzyme.
- This enzyme is responsible for the occurrence of a chemical reaction.
- This chemical reaction leads to the formation of a protein.
- The protein expresses a specific hereditary trait.

3. Muscle atrophy and weakness in newborns?

A lethal mutation is a harmful genetic change that leads to severe

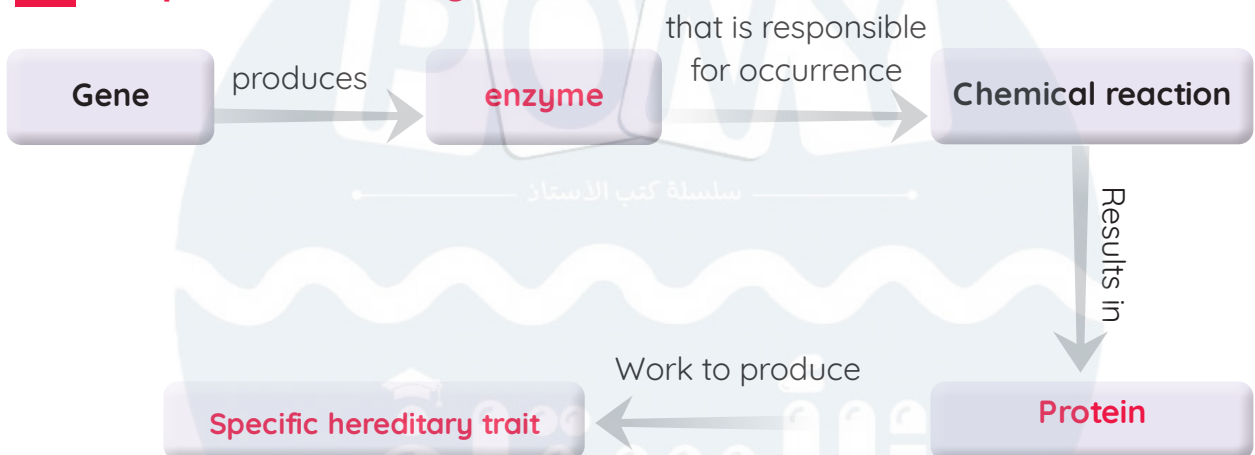
muscle wasting and weakness.

4. Placing watermelons in square-shaped metal molds when they grow?
They will take a square shape to facilitate their transportation.

10 What is the benefit of genes?

Genes are responsible for the appearance of hereditary traits in living organisms.

11 Complete the following chart:



12 From the opposite figure:

1. What is this child known as?
Albino child
2. What is the reason for the child being born in this way?

Due to spontaneous mutation.



1 Put (✓) or (x):

1. The importance of the water cycle in nature is the renewal of water resources. (✓)
2. Water evaporates when it cools. (x)
3. Water is used in many fields, including agriculture and industry. (✓)
4. The higher the temperature of water vapor, the faster the condensation. (x)
5. There are many forms of precipitation, such as rain, snow, and hail. (✓)
6. Evaporation of water occurs when it comes into contact with a cold surface. (x)
7. Winds move clouds containing heavier or smaller water droplets. (x)

2 Complete the following sentences:

1. Water exists in three states, which are liquid, solid, and gas.
2. Water changes from the liquid state to the gaseous state when it gains thermal energy.
3. Water changes from the gaseous state to the liquid state when it loses heat in a process known as condensation.
4. Sources of water vapor in nature include bodies of water, transpiration, and sweat of humans and animals.
5. Groundwater is stored beneath the Earth's surface.
6. The basic stages of the water cycle are evaporation, condensation, precipitation, surface runoff, and infiltration.

3 Compare between:

1. Infiltration and surface runoff

Infiltration	Surface Runoff
It is a process in which a portion of water infiltrates into the ground and is stored as groundwater.	It is a process in which rainwater flows across the Earth's surface into rivers and lakes, then into oceans or seas.

2. Evaporation and transpiration

Evaporation	Transpiration
It is the change of water upon gaining heat from the liquid state to the gaseous state at any temperature.	It is the process by which plants lose water in the form of water vapor.

4 Choose from column (B) what suits it in column (A) :

Column (A)	Column (B)
1. The percentage of water in the human body.	a. 3%
2. The percentage of fresh water compared to the percentage of water on the Earth's surface.	b. 97%
3. The percentage of land in the Earth's composition.	c. 71%
4. The percentage of salt water compared to the percentage of water on the Earth's surface.	d. 29%
5. The percentage of water in the Earth's composition.	e. 70%
1. e 2. a 3. d 4. b 5. c	

5 What is meant by each of the following:

1. Evaporation

It is the change of water upon gaining heat from the liquid state to the gaseous state at any temperature.

2. Boiling

It is the change of water upon gaining heat from the liquid state to the gaseous state at a specific temperature, and it occurs to all molecules of water.

3. Condensation

It is a process in which water changes from the gaseous state to the liquid state by losing heat at any temperature.

4. The water cycle

It is a natural process that involves the movement of water between the atmosphere and Earth in a closed, multi-path cycle.



5. Transpiration process

It is the process by which plants lose water in the form of water vapor.

6 State the importance of:

1. Water

Humans use water in many fields, such as drinking, agriculture, industry, and sanitation.

2. The Sun in the water cycle in nature

The Sun causes water to evaporate from the Earth to the atmosphere.

3. Gravity in the water cycle in nature

Gravity causes water to return from the clouds to the Earth.

4. Wind in the water cycle in nature

Wind moves accumulated water droplets to form clouds.

5. The water cycle

The water in bodies of water is renewed through the continuity of the water cycle.

7 Give reasons for the following:

1. Fresh water consumption must be rationalized. _____

To ensure the sustainability of fresh water in the future.

2. Water droplets form on the outer surface of a cup containing water and ice cubes.

Due to the condensation of water vapor in the air, forming water droplets on the outer surface of the cup.

3. The Sun and gravity maintain the continuity of the water cycle.

Because the Sun causes water to move from the Earth to the atmospheric air, while gravity causes water to return from the clouds to the Earth's surface during precipitation.

4. Sea and ocean water are desalinated.

To face the shortage of freshwater resources suitable for drinking, irrigation, ... etc.





8 What are the results of:

1. Placing a cup of water in a sunny place for several hours?

Water evaporates and changes from the liquid state into the gaseous state.

2. Placing pieces of ice in a cup of water?

Water droplets form on the outer surface of the cup due to the condensation process.

3. The water cycle stopping suddenly?

Water isn't renewed continuously in nature.

4. The cloud temperature being below the freezing point?

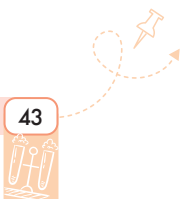
Snow precipitates instead of rain.

5. Small ice crystals gathering during thunderstorms?

Hail precipitates instead of rain.

الأستاذ

سلسلة كتب الأستاذ



1 Put (✓) or (X):

1. Rocks are solid bodies composed of only one mineral. (X)
2. Rocks are classified into three types: sedimentary, igneous, and calcareous. (X)
3. Only chemical changes lead to geological processes in rocks. (X)
4. Weathering is the process of disintegrating and breaking down rocks. (✓)
5. Mechanical weathering is the process of disintegrating and breaking rocks without a change in their chemical composition. (✓)
6. Chemical weathering is the process of disintegrating and breaking rocks with a change in their properties. (✓)
7. Freezing of water in rock cracks causes the rocks to freeze. (X)
8. Yellowstone National Park is a good example of chemical weathering. (✓)
9. Calcium carbonate powder is used to make casts for broken bones. (✓)

2 Complete the following sentences:

1. Rocks are classified into three types: sedimentary rocks, metamorphic rocks, and igneous rocks.
2. The freezing of water in cracks is one of the causes of mechanical weathering.
3. The freezing of water in cracks, wind blowing, and the thermal expansion and contraction of the minerals forming the rocks are among the causes of mechanical weathering.
4. Spherical weathering is a form of chemical weathering.
5. Limestone rocks and sandstone rocks are examples of sedimentary rocks.
6. Chemical substances, such as acids and the mineral materials present in groundwater, cause chemical weathering.
7. Calcium carbonate powder is used in making casts used for patients with bone fractures.
8. Sedimentary rocks are characterized by being porous and containing fossils.

9. When sedimentary rocks are exposed to **pressure** and **heat**, they transform into metamorphic rocks.
10. When limestone rocks are exposed to heat and pressure, they transform into **marble**.
11. When **sandstone** rocks are exposed to heat and pressure, they transform into quartzite rocks.
12. Igneous rocks are classified into two types: **plutonic igneous rocks** and **surface igneous rocks**.
13. Examples of metamorphic rocks are **limestone** and **sandstone**.
14. Basalt rocks and **pumice** are **surface** igneous rocks.
15. **Granite** and **gabbro** are plutonic igneous rocks.
16. When sediments are exposed to compaction and lithification, they transform into **sedimentary rocks**.
17. When igneous rocks are exposed to **weathering** and **erosion**, they transform into sediments.
18. Metamorphic rocks form when **limestone** and **sandstone** rocks are exposed to heat and pressure.
19. Plants represent the organic source for the formation of **coal**, while **marine microorganisms** represent the organic source for the formation of petroleum.
20. Natural gas is composed of **methane**, which makes up 90% of its components.

3 Which of the following rocks are sedimentary, igneous, or metamorphic rocks?

- | | |
|--------------|--------------------|
| 1. Granite | (Igneous rock) |
| 2. Marble | (Metamorphic rock) |
| 3. Limestone | (Sedimentary rock) |
| 4. Pumice | (Igneous rock) |
| 5. Basalt | (Igneous rock) |
| 6. Claystone | (Sedimentary rock) |
| 7. Gabbro | (Igneous rock) |

8. Quartzite

(Metamorphic rock)

9. Sandstone

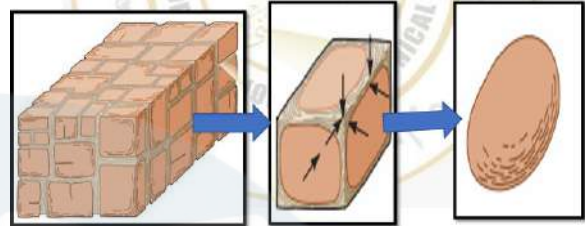
(Sedimentary rock)

4 The following figure shows the formation of some rocks through chemical weathering, answer:

1. What is the name of weathering?

Spherical weathering

2. Mention how it occurs.



Granite blocks are subjected to chemical weathering, so the corners weather more quickly, and the rock turns into a spherical shape.

5 What are the rocks that can be transformed from one type to another?

- Limestone changes into marble by heat and pressure.
- Sandstone changes into quartzite by heat and pressure

6 What are the geological processes that occur to form rocks over the ages?

Weathering and erosion, extreme pressure and heat, melting and cooling (rock cycle)

7 Compare between each the following:

1. Sedimentary, metamorphic, and igneous rocks, in terms of: Method of formation – Examples.

P.O.C	Sedimentary rocks	Metamorphic rocks	Metamorphic rocks
a. Method of formation	They are cohesive rocks formed through the lithification of sediments.	They are rocks that are formed when rocks under the Earth's surface are subjected to pressure and heat without reaching the melting point.	They are rocks formed as a result of the cooling of magma in the cracks and layers within the Earth's crust or cooling of lava on the Earth's surface.
b. Examples	Limestone rocks Sandstone rocks	Marble Quartzite	Granite – Gabbro Basalt – Pumice

2. Plutonic and surface igneous rocks, in terms of: Method of formation – Crystal size – Examples.

P.O.C	Plutonic igneous rocks	Surface igneous rocks
a. Method of formation	They are formed when the magma between the cracks and layers of the Earth cools very slowly.	They are formed when the lava on the Earth's surface cools very quickly.
b. Crystal size	Large crystals	Small crystals
c. Examples	Granite – Gabbro	Basalt – Pumice

8 What is meant by each of the following:

1. Rocks

They are solid materials composed of one or several minerals.

2. Weathering

It is the process of breaking down and fragmenting the rocks, which may take millions of years.

3. Mechanical weathering

It is the process of breaking down and fragmenting the rocks without any change in their chemical structure.

4. Chemical weathering

It is the process of breaking down and fragmenting the rocks with a change in their chemical structure.

5. Erosion

It is the process of transportation and sedimentation of rock fragments, resulting from weathering, away from the areas where they were originally found.

6. Lithification

It is the process of compaction of sediments over years into layers, forming sedimentary rocks.



7. Sediments

They are fragments of rocks that have been eroded from the area where the weathering process occurred.

8. Sedimentary rocks

They are cohesive rocks formed through the lithification of sediments.

9. Magma

It is a very hot molten material formed from the melting of minerals that make up some rocks in the Earth's interior.

10. Lava

It is the magma when it reaches the Earth's surface.

11. Rock cycle

It is the transformation of rocks from one type to another through several processes, such as weathering and erosion, extreme pressure and heat, and melting and cooling.

12. Fossil fuel

It is a fuel that formed millions of years ago as a result of a series of physical and chemical changes of organic substances in the Earth's interior.

9 State the importance of:

1. Marble

It is used in the construction of the Taj Mahal in India.

2. Limestone rock powder

Limestone rock powder is used to make casts for individuals with bone fractures.

10 Give reasons for:

1. Yellowstone National Park is an example of chemical weathering.

Because it causes the breaking down of rock with a change in chemical structure by mineral-rich hot water.



2. The water coming from Ethiopia appears brown.

Because this water transports gravel, sand, silt, and clay, which result from the weathering process.

3. Erosion is both a beneficial and harmful process for the environment.

- Erosion has beneficial effects, such as the formation of agricultural soil in Egypt and river deltas.

- Erosion has harmful effects, such as coastal erosion due to sea waves.

4. Sedimentary rocks are characterized by being porous.

Due to the presence of spaces between the particles that compose them.

5. Sedimentary rocks are characterized by the presence of fossil.

Because sedimentary rocks protect the remains of old animals from decaying as they are formed through the lithification of sediments.

6. The crystals of surface igneous rocks are small.

Because surface igneous rocks are formed when the lava on the Earth's surface cools very quickly.

7. The crystals of plutonic igneous rocks are large.

Because plutonic igneous rocks are formed when the magma between the cracks and layers of the Earth's crust cools very slowly.

11 What happens when:

1. A glass bottle of water is filled to its top and placed in the refrigerator for several hours?

The bottle breaks due to the expansion of water as it freezes into ice.

2. Water freezes in the cracks between the rocks?

Its volume increases, causing the breaking down of the rocks (mechanical weathering).



3. Water flows between rocks?

Water freezes when the temperature decreases, so the cracks in the rocks become wider.

4. The temperature of the minerals that make up the rock rises during the day?

During the day, the temperature rises, causing the minerals inside the rocks to expand.

5. The temperature of the minerals that make up the rock decreases at night?

At night, the temperature decreases, causing the minerals inside the rocks to contract.

6. Plant roots grow within the cracks between rocks?

The cracks become wider and the rocks break down easily.

7. We add drops of hydrochloric acid to a piece of limestone?

The rock is eroded and gas bubbles are formed.

8. We bring a matchstick close to the gas produced by adding acid to the limestone?

The matchstick is turned off.

9. Limestone rocks are exposed to heat and pressure?

It changes into marble.

10. Magma comes out to the Earth's surface?

Lava cools very quickly, forming plutonic igneous rocks.

11. Magma interferes between the cracks and layers of the Earth?

Magma cools very slowly, forming surface igneous rocks.



12 What is the name of each figure?



1 Limestone rock



2 Sandstone rock



3 Marble



4 Granite



5 Basalt



6 Pumice



7 Gabbro



8 Quartzite

حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

الترم الثاني





Final Revision

Mr. Ahmed Elbasha

✱ (1) Write the scientific term:

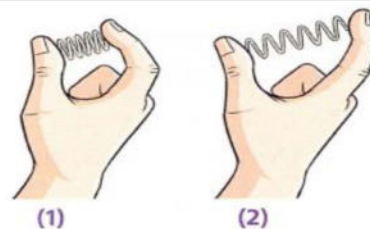
- 1) The attraction force between positive metal ions and the negative valence electron cloud which surrounds them. (.....)
- 2) A mixture composed of the melts of two metals or more. (.....)
- 3) A nonmetallic element that is a good conductor of electricity. (.....)
- 4) The shortest straight path connecting between the starting point and the end point in a constant direction. (.....)
- 5) The distance covered per unit time. (.....)
- 6) The ability to do work. (.....)
- 7) The conversion of water from the gaseous state to the liquid state upon losing heat. (.....)
- 8) A natural process involving the movement of water between the atmospheric air and the earth in a closed multi-path cycle. (.....)
- 9) The process of water loss from plants in form of water vapour. (.....)
- 10) Elements that have metallic luster and are good conductors of heat and electricity. (.....)
- 11) The process of falling of water from clouds to the Earth's surface in form of rain snow or hail due to the effect of the Earth's gravity. (.....)
- 12) A substance whose dissolution in water leads to an increase in the percentage of OH^- anions in the solution. (.....)
- 13) Metal oxides, some of which dissolve in water forming alkalis. (.....)
- 14) The energy acquired by an object as a result of its motion. (.....)
- 15) The sum of the potential and the kinetic energies of any moving object. (.....)

- 16) The total length of any path taken by the object during its moving from the starting point to the end point. (.....)
- 17) A scale ranging between the values 0 to 14, and used to determine the acidity and the basicity of solutions. (.....)
- 18) A device used to measure the pH value of solutions directly and accurately. (.....)
- 19) The conversion of water from the liquid state to the gaseous state upon gaining heat. (.....)
- 20) Nonmetal oxides that dissolve in water forming acids. (.....)
- 21) Rains which result from the dissolution of acidic oxides in the atmospheric water vapor. (.....)
- 22) Cohesive rocks formed from the lithification of sediments. (.....)
- 23) The compaction of sediments over the years into layers forming sedimentary rocks. (.....)
- 24) An ion composed of more than one atom of more than one element. (.....)
- 25) A nutritional relationship between two individuals where both benefit from each other without causing harm to either of them. (.....)
- 26) A nutritional relationship between two individuals, one of them benefits and the other neither benefits nor is harmed. (.....)
- 27) Autotrophic organisms that can make their own food through the photosynthesis process. (.....)
- 28) The process of breaking down and fragmenting rocks without any change in their chemical structure. (.....)
- 29) The process of breaking down and fragmenting rocks with a change in their chemical structure. (.....)
- 30) The fuel formed in the Earth's interior. (.....)
- 31) pyramid represents the flow of energy and its amounts between different trophic levels in any food chain. (.....)
- 32) A vital process aims to produce new individuals resembling their parents. (.....)
- 33) Thread-like bodies representing the genetic material of the eukaryotic organism. (.....)

- 34) The emergence of a new hereditary trait didn't previously exist, as a result of a change in the nature of the gene responsible for it. (.....)
-
- 35) Rocks formed from the solidification of lava or magma. (.....)
-
- 36) Rocks formed from the slow cooling of magma in the cracks of the Earth's crust. (.....)
-
- 37) Organisms that obtain energy from the breaking down of the organic substances found in dead bodies. (.....)
-
- 38) The science that studies the transmission of genetic traits from parents to offspring. (.....)
-
- 39) Chemical weathering that leads to the formation of spheres of rocks. (.....)
-
- 40) Magma when it reaches the Earth's surface. (.....)
-
- 41) Consumers that feed on plants and animals. (.....)
-
- 42) Solid materials composed of one or several minerals. (.....)
-
- 43) The central point at which the two chromatids of the chromosome are connected. (.....)
-
- 44) The energy stored in the object as a result of the work done on it. (.....)
-
- 45) A group of individuals of the same species living in a particular place at the same time. (.....)
-
- 46) A nutritional relationship between two individuals where one of them benefits, while the other individual is harmed or loses its life. (.....)
-
- 47) Any place that includes living organisms and non-living (abiotic) components and includes several levels of organization. (.....)
-
- 48) Animals that depend on the producers to obtain their food. (.....)
-

***(2) Choose the right answer:**

1. What is the amount of work done by a student pushing the wall of his room with a force of 500 N?
a. zero. b. 2251 c. 5001 d. 10001
2. What is the quantity which has the same unit of measurement as force?
a. Energy. b. Displacement. c. Speed. d. Weight.
3. The percentage of water on the Earth's surface is approximately
a. 3% b. 29% c. 70% d. 71%
4. What is the process that the plants carry out in the water cycle?
a. Condensation. b. Evaporation. c. Precipitation. d. Transpiration.
5. Which of the following is the correct arrangement of the hardness of sodium $_{11}\text{Na}$, magnesium $_{12}\text{Mg}$ and aluminum $_{13}\text{Al}$?
a. $\text{Na} > \text{Mg} > \text{Al}$ b. $\text{Al} > \text{Mg} > \text{Na}$
c. $\text{Mg} > \text{Na} > \text{Al}$ d. $\text{Al} > \text{Na} > \text{Mg}$
6. What are the two processes that occur at any temperature ?
a. Melting and boiling. b. Evaporation and condensation.
c. Melting and evaporation. d. Evaporation and boiling.
7. The process that precedes condensation directly in the natural water cycle is
a. surface runoff. b. evaporation.
c. infiltration. d. precipitation.
8. The hardest element of the following is
a. $_{13}\text{Al}$ b. $_{17}\text{Cl}$ c. $_{12}\text{Mg}$ d. $_{11}\text{Na}$
9. Copper is a component of the bronze alloy, its percentage is
a. 5% b. 15% c. 65% d. 95%
10. From the rocks that is formed due to the exposure to extreme pressure and heat is
a. quartzite. b. claystone. c. pumice. d. gabbro.
11. From the opposite figure. Which spring stores greater amount of energy?
a. (1) / Because the work done on it is greater.
b. (1) / Because the work done on it is less.
c. (2) / Because the work done on it is greater.
d. (2) / Because the work done on it is less.
12. Metamorphic rocks are transformed into igneous rocks through
a. erosion and weathering. b. melting and crystallization.
c. weathering and transportation. d. sedimentation and lithification.



13.What is the gas which comprises more than 90% of natural gas?

- a. Carbon dioxide. b. Chlorine. c. Nitrogen. d. Methane.

14.The kinetic energy of an object depends on

- a. the weight of the object and its height.
b. the mass of the object and its speed.
c. the gravitational field intensity and the speed.
d. distance and time.

15.The kinetic energy of any moving object is determined by the mathematical relation

- a. mgh b. $\frac{1}{4}mv^2$ c. $\frac{d}{t}$ d. $\frac{1}{2}mv^2$

16.When an object moves over a distance of 20 m in a straight line in a constant direction its displacement equals

- a. zero b. 20 m c. 40 m d. 80m

17.From the opposite figure :

The part referred to by the letter (X) is a

- a. chromatid.
b. chromosome.
c. histone.
d. nucleotide.



18.The liquid element which is bad conductor of heat and electricity is

- a. bromine. b. chlorine. c. mercury. d. lithium.

19.The opposite figure shows three positions in the path of a moving car. Which of the following expresses the change in the car's potential energy when moving from X to Y and from Y to Z respectively ?

- a. Increases, increases.
b. Increases, remains unchanged.
c. Remains unchanged, increases.
d. Remains unchanged, remains unchanged.



20.The remains of marine microorganism transform after millions of years in the Earth's interior into

- a. granite. b. limestone. c. petroleum oil. d. coal.

21.Ca²⁺ ions combine with PO₄³⁻ ions forming a salt its molecular formula is

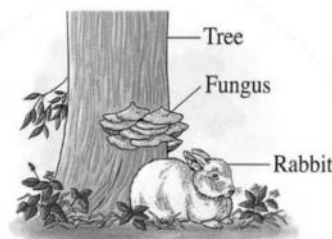
- a. CaPO₄ b. Ca₂(PO₄)₃
c. Ca (PO₄)₂ d. Ca₃(PO₄)₂

22.The correct name of the compound (NH₄)₃PO₄ is

- a. ammonium phosphide. b. ammonium phosphate.
c. nitrogen phosphide. d. nitrogen phosphate.

23. In the opposite figure: The tree, fungus and rabbit from

- a. omnivorous organisms.
- b. herbivorous organisms.
- c. biotic population.
- d. biological community.

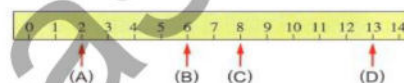


24. Each of the following is a unit of measuring distance, except

- a. cm
- b. km
- c. kg
- d. m

25. The opposite figure shows the pH values of four different solutions. The strongest alkali is

- a. (A).
- b. (B).
- c. (C).
- d. (D).



26. From the plutonic igneous rocks is

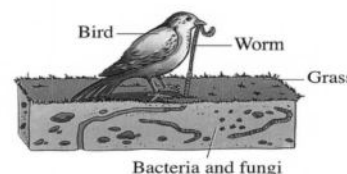
- a. granite.
- b. marble.
- c. basalt.
- d. quartzite.

27. pH value of a solution is changed from 8 to 5, that means it was

- a. acidic and becomes alkaline.
- b. acidic and becomes neutral.
- c. alkaline and becomes neutral.
- d. alkaline and becomes acidic.

28. The opposite figure shows several different living organisms living in a certain place. The worms in this environment represent

- a. a biological community.
- b. an ecosystem.
- c. a biotic population.
- d. a biosphere.



29. When hydrochloric acid HCl reacts with sodium hydroxide NaOH, the formed salt is

- a. NaCl_2
- b. H_2O
- c. Na_2O
- d. NaCl

30. When lava cools, it forms a rock called

- a. gabbro.
- b. pumice.
- c. granite.
- d. sandstone.

31. The potential energy of an object depends on

- a. its weight and speed.
- b. its weight and mass.
- c. its speed and height.
- d. its weight and height

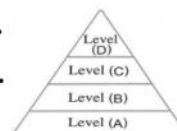
32. The combination of hydrogen with each of the following nonmetals produces acids, except

- a. chlorine.
- b. bromine.
- c. oxygen.
- d. iodine.

33. The opposite diagram represents an energy pyramid in which the organisms of level (A) obtain their energy from

- a. the producers.
c. the sun.

- b. organisms of level (B).
d. organisms of level (D).



34. The potential energy of an object increases when

- a. its speed increases.
c. its height decreases.

- b. its weight increases.
d. its weight decreases.

35. Which of the following rocks is formed from the lithification of sediments?

- a. Quartzite. b. Pumice. c. Sandstone. d. Marble.

36. Histones are

- a. enzymes.
c. fats.

- b. proteins.
d. carbohydrates

37. At the maximum height reached by an object thrown upwards,

- a. potential energy is zero.
c. mechanical energy is zero.

- b. kinetic energy is zero.
d. the mass of the object is zero.

38. The solution with pH equals 1 is

- a. strong alkali.
c. strong acid.

- b. weak alkali.
d. weak acid.

39. pH of acid rains can be equals

- a. 5 b. 7 c. 9 d. 11

40. Among the organisms that feed on the bodies of dead organisms are

- a. hyenas. b. fungi. c. cockroaches. d. foxes.

41. Limestone is composed of

- a. sodium carbonate. b. calcium carbonate.
c. ammonium sulphate. d. calcium sulphate.

42. The liquid element that has metallic luster is

- a. mercury. b. bromine. c. lithium. d. chlorine.

43. The central point at which the two chromatids of the chromosome are connected is called

- a. the nucleotide. b. the centrosome.
c. the gene. d. the centromere.

44. Among the basic oxides is

- a. SO_2 b. SO_3 c. NaO_2 d. Na_2O

45. The molecular formula of hydrochloric acid is

- a. HCl b. HClO c. HClO_2 d. HClO_3

46. The bronze alloy is formed by adding a small percentage of metal (X) to metal (Y). Which of the following identifies the metals (X) and (Y)?

- a. (X): Copper, (Y): Tin.
- b. (X): Copper, (Y): Sulphur.
- c. (X): Sulphur, (Y): Copper.
- d. (X): Tin, (Y): Copper.

47. Among the forms of the chemical weathering is

- a. the weathering by water flow.
- b. the weathering by plant roots.
- c. the spherical weathering.
- d. the weathering by wind blowing.

48. The ion which is responsible for the acidic properties is

- a. NH^+
- b. O_2^-
- c. H^+
- d. OH^-

49. The compound which is used in antacids is

- a. MgCl_2
- b. $\text{Mg}(\text{OH})_2$
- c. H_2CO_3
- d. NaO_2

50. Which of the following obtain energy from the other three types ?

- a. Producers.
- b. Decomposers.
- c. Carnivores.
- d. Herbivores.

51. The main source of energy on the surface of the Earth is

- a. the producers.
- b. the plants.
- c. the Sun.
- d. the consumers.

52. The correct name of H_2SO_4 acid is

- a. sulphuric acid.
- b. hypochloric acid.
- c. sulphurous acid.
- d. hypochlorous acid.

53. Which of the following is inherited by a child from their parents?

- a. Driving a car.
- b. Curly hair.
- c. Strong muscles.
- d. Proficiency in French.

54. Acids can contain the following atomic groups, except

- a. carbonate group.
- b. sulphate group.
- c. nitrate group.
- d. hydroxide group.

55. The amount of energy lost when moving from any trophic level to the next level in the energy pyramid equals

- a. 1 %
- b. 10%
- c. 90%
- d. 100%

56. All the following acids are strong, except

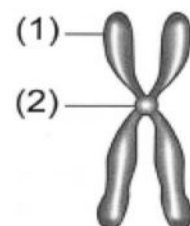
- a. nitric acid.
- b. acetic acid.
- c. sulphuric acid.
- d. hydrochloric acid.

*** (3) Put (\checkmark) or (X) :**

1. Pumice is considered as a plutonic igneous rock with small crystals. ()
2. Acidic soil is treated with adding basic substances to it such as HCl. ()
3. Magma takes a long time to crystallize, hence forming rocks with large crystals. ()
4. Energy flows from the consumers to the producers in the food web. ()
5. Number of rabbits in a biological community increases when predators decrease. ()
6. The kinetic energy of an object at rest equals zero. ()
7. The kinetic energy of an object is doubled when its speed is doubled. ()
8. The number of H^+ ions equals the number of OH^- ions in distilled water. ()
9. The food chain consists of several overlapped food webs. ()
10. The unit of measurement for kinetic energy is Newton. ()
11. Lithium and sulphur can be differentiated by electrical conductivity. ()
12. An individual inherits half of his genetic material from the father and the other half from the mother. ()
13. The animal is the only living organism that makes its own food. ()
14. The speed of a pendulum ball is zero when it passes through the original position. ()
15. Bromine is a liquid element with metallic luster. ()
16. The nutritional relationship between lion and tiger is a predation. ()
17. Pure gold metal is harder than gold alloys. ()
18. Liquid water converts into ice through condensation process. ()
19. The product of the speed of the object multiplied by the time equals the work. ()
20. The strength of the acidic solution increases as its pH value approaches 14. ()
21. Plants store light energy in the form of chemical energy through the photosynthesis process. ()
22. The primary consumer is always a herbivore. ()

✱(4) Complete the following:

1. The potential energy of an object depends on and
2. The strength of the alkaline solution increases as the pH value approaches, while the strength of the acidic solution increases as the pH value approaches
3. The mass is estimated in, while the weight is estimated in
4. The process of is carried out to face the shortage of fresh water resources in remote areas.
5. Each gene produces a specific responsible for the occurrence of a, leads to the formation of a that expresses a specific hereditary trait.
6. The molecular formula of nickel chloride salt is
7. The elements are bad conductors of heat and electricity, except which is a good conductor of electricity.
8. is the process of breaking down and fragmenting rocks, while is the transport of sediments from one location and their sedimentation in another.
9. **From the opposite figure :**
The figure represents
The number (1) refers to, while the number (2) refers to
10. Basalt is an igneous rock, while granite is an igneous rock.
11. The dissolution of oxides in water forms acids, while the dissolution of oxides in water forms alkalis.
12. As the number of valence electrons of the metal atom increase, the strength of its metallic bond
13. The potential energy of an object = x and its unit of measurement is
14. The organic origin of coal is, while the organic origin of natural gas is
15. Hydrobromic acid is composed of cation and anion.
16. The food chain begins with such as and ends with such as bacteria.



- 17..... are formed from the exposure of the rocks to extreme pressure and heat.
- 18.The opposite figure shows a relationship between which is cat and which is mouse.
- 19.In the conversion processes of the matter, and processes occur at any temperature, while the process occurs at a certain temperature.
- 20.Granite is made up of crystals, while basalt is made up of crystals.
- 21.The kinetic energy of an object increases with increasing either or
- 22.If a force of 200 N acts on a car and does not move it from its position, the work done on it equals
- 23.The molecular formula of an acid begins with the symbol of cation, while the molecular formula of an alkali ends with the symbol of anion.
- 24..... traits are transmitted from parents to offspring without learning.
- 25.Unit of measurement of the speed of an object is or
- 26.Lemon is , while the grease cleaner is
- 27.The number of chromosomes in human skin cell is chromosomes.
- 28.Gabbro from igneous rocks, while pumice from igneous rocks.
- 29.The nutritional relationship between bees and plant flowers is while the nutritional relationship between Dionaea plant and insect is
- 30.Water vapour condenses and turns into droplets of water upon thermal energy, while ice melts turning into liquid water upon thermal energy.
- 31.When a ball falls vertically downwards, the potential energy and the kinetic energy
- 32.Producers obtain energy from while the obtain their energy from producers.
- 33.Types of weathering include weathering and weathering.
- 34.The genetic material is found inof the prokaryotes, while it is found in of the eukaryotes.
- 35.Oxides are divided into oxides and oxides.
- 36.Claystone from rocks, while marble from rocks.
- 37.A chromosome is chemically composed of a nucleic acid called twisted around a protein known as
- 38..... is a strong alkali, while is a weak acid.



***(5) Give reasons for:**

1. The kinetic energy of an object cannot exceed its mechanical energy.
.....
2. It is possible to distinguish between acids and alkalis by using litmus strips.
.....
3. The kinetic energy of a truck is greater than the kinetic energy of a car when their speeds are equal.
.....
4. DNA is the source of genetic information for living organisms.
.....
5. The melting point of magnesium is higher than that of sodium.
.....
6. The High Dam has great importance in generating electrical energy in Egypt.
.....
7. The solar energy is the primary source of energy stored in fossil fuels.
.....
8. The total charge of the molecule of any compound equals zero.
.....
9. Water is vital for all living organisms on the surface of the Earth.
.....
10. The nucleic acid DNA is known as the double helix.
.....
11. Magnesium $_{12}\text{Mg}$ is a metallic element, while sulphur $_{16}\text{S}$ is a nonmetallic element.
.....
12. Aluminum $_{13}\text{Al}$ is harder and has a higher melting point than sodium $_{11}\text{Na}$
.....
13. A person pushing against a wall does not perform work.
.....
14. Bacteria and fungi are called decomposers.
.....

15.The bronze alloy is used in jewelry and statues instead of copper metal.

.....

16.The melting of ice is not considered as a chemical weathering.

.....

17.The nutritional relationship between bees and flowers of plants is a mutualistic relationship.

.....

18.The role of fuel within a car is similar to the role of food within a living organism.

.....

19.Gabbro is a plutonic igneous rock, while quartzite is a metamorphic rock.

.....

20.Producers are autotrophic, while consumers are heterotrophic.

.....

21.Alloys are preferred to use in industry instead of pure metals.

.....

22.The bear and the raven are from omnivorous organisms.

.....

23.Graphite is used in dry cells despite being a nonmetal.

.....

***(6) What happens when:**

1. Acids react with alkalis.

.....

2. A piece of sulphur is hammered.

.....

3. The weight of the object is doubled with constant height

"Regarding its potential energy"

.....

4. Hydrogen chloride gas HCl dissolves in water.

.....

5. Sulphur and nitrogen oxides dissolve in the water of the rains.

.....

6. Exerting a suitable force on a stationary object (an object at rest).

.....

7. The pendulum ball is drawn upwards from its original position.

"Regarding the speed of the ball".

.....

8. The mass of a moving object decreases to half while its speed remains constant

"Regarding kinetic energy".

.....

9. The free falling of an object from a height

"Regarding its potential and kinetic energies."

.....

10. A metal melt is added to another metal melt.

.....

11. Magnesium burns in the presence of oxygen, then the product dissolves in water.

.....

12. The vertical distance that the object is lifted above the ground decreases to half with constant mass

"Regarding its potential energy".

.....

13. Fossil fuels burn in factories and cars.

.....

14. The pendulum ball reaches its highest point during its motion

"Regarding its kinetic and potential energies."

.....

15. Calcium hydroxide Ca(OH)_2 dissolves in water.

.....

16. Sulphur burns in the presence of oxygen, then the product dissolves in water.

.....

17. The speed of a moving object is doubled while its mass remains constant

"Regarding kinetic energy".

.....

18. The number of valence electrons in metal atoms increases

"In order to: Their melting points".

.....

19. The pendulum ball passes through the original position during its motion

"Regarding its kinetic and potential energies."

.....

20. A red litmus strip is placed in a beaker containing sodium hydroxide solution.

.....

✱ **(7) Choose from column (B) what suits it in column (A) :**

1.

(A) Type of rocks	(B) Resulting from
1. Plutonic igneous rocks	a. The exposure of the rocks beneath the Earth's surface to extreme pressure and heat
2. Sedimentary rocks	b. Plutonic igneous rock.
3. Metamorphic rocks	c. The lithification of sediments.
4. Pumice	d. Cooling of magma very slowly in the cracks and the layers of the Earth's crust.
5. Gabbro	e. Surface igneous rock.

1. 2. 3. 4. 5.

2.

(A) Physical quantity	(B) Unit of measurement
1. Energy	a. kg
2. Mass	b. J
3. Weight	c. m
4. Height	d. m/s
5. Speed	e. N

1. 2. 3. 4. 5.

3.

(A) Physical quantity	(B) Applicable law
1. Condensation	a. The conversion of water from gaseous state to liquid state.
2. Evaporation	b. The conversion of water from liquid state to gaseous state.
3. Precipitation	c. The flow of water over the surface of the Earth.
4. Surface runoff	d. The flow of water through soil layers.
5. Infiltration	e. The falling of rain on the surface of the soil.

1. 2. 3. 4. 5.

4.

(A) Physical quantity	(B) Applicable law
1. Potential energy	a. Force \times Displacement
2. Speed	b. Mass of the object \times Gravitational field intensity
3. Work	c. Weight of the object \times Height
4. Weight	d. Distance \div Time

1. 2. 3. 4.

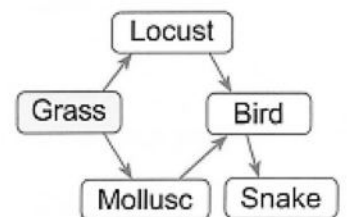
* (8) Correct the underlined words :

1	<u>Omnivores</u> feed on the remains of dead organisms.	(.....)
2	Both individuals are harmed by the <u>commensalism</u> .	(.....)
3	Clouds are formed through the <u>freezing</u> of water vapor found in the air.	(.....)
4	The gene produces <u>a specific protein</u> that is responsible for occurrence of a specific chemical reaction.	(.....)
5	Melting process is the reverse of <u>condensation</u> process.	(.....)
6	The individual harmed in the predation is called <u>the host</u> .	(.....)
7	Water vapor converts into liquid water through the <u>melting</u> process.	(.....)
8	The scientist <u>Tatum</u> is considered the founder of genetics.	(.....)
9	The concept of water desalination depends on the processes of <u>boiling</u> and condensation.	(.....)
10	<u>The commensal</u> doesn't benefit nor is harmed in commensalism.	(.....)
11	<u>Predators</u> breaking down the wastes and the dead bodies into simpler substances that mix with the soil.	(.....)
12	<u>Oxygen</u> flows among living organisms in food chains.	(.....)

* (9) Problems:

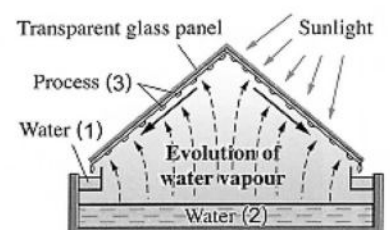
1. Study the following figures, then answer the questions:

- How many food chains do make up this web?
- Complete:** To reduce the number of mollusks, it is necessary to increase the number of and reduce the number of



2. The opposite figure represents one of the devices used in remote areas :

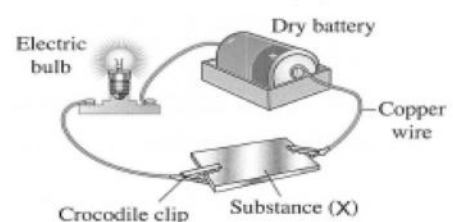
- What is this device used for ?
- Replace the numbers from (1) to (3) with the suitable data.



3. In the opposite figure:

What happens to illuminate the bulb, with explanation when the substance (X) is replaced with each of the following :

- A piece of graphite.
- A piece of sulphur.



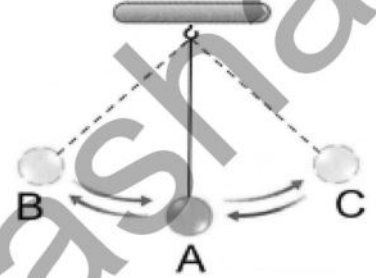
4. Opposite figure illustrates a nutritional relationship between two living organisms:

1. What type of nutritional relationship is illustrated in this figure ?
2. Mention the beneficiary individual and the harmed

**5. The figure illustrates the motion of a simple pendulum:**

Identify the position(s) at which:

- 1- The kinetic energy is at its maximum.
- 2- The potential energy equals zero.
- 3- The potential energy is at its maximum.
- 4- The speed of the pendulum ball equals zero.

**6. The opposite figures show crystals of two igneous rock samples:**

- (1) What is the type of each of the rocks (A) and (B) ?
- (2) Give an example for each type.



Rock (A)



Rock (B)

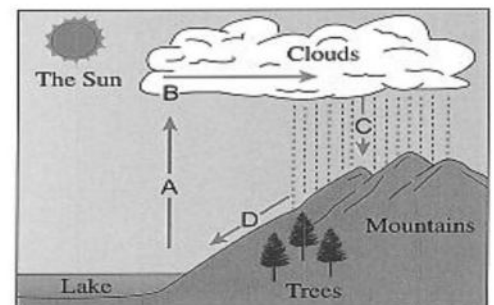
7. Give one example for each of the following :

1. A negatively charged atomic group.
2. A strong acid.
3. An atomic group with a charge of -2
4. A weak acid.
5. A strong alkali.

8. The opposite diagram represents the water cycle:

Replace the letters (A), (B), (C) and (D) with the appropriate terms from the following :

- Condensation.
- Evaporation.
- Surface runoff.
- Precipitation.

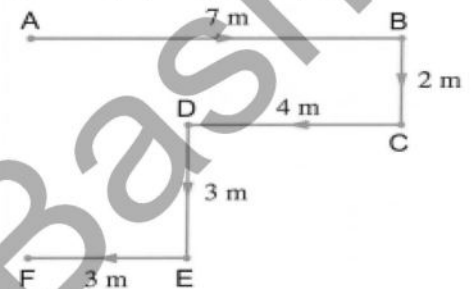


9. The opposite figure represents one of the nutritional relationships:

1. What is the name of the relationship between these two organisms ?
2. Which of the two organisms benefits from this nutritional relationship?.

**10. Study the following figures, then answer the questions :**

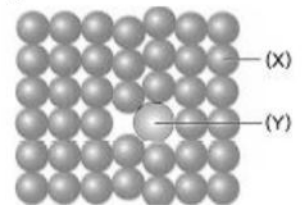
The opposite figure illustrates the path taken by an object from point (A) to point (F) in a time of 3 sec **Calculate:**



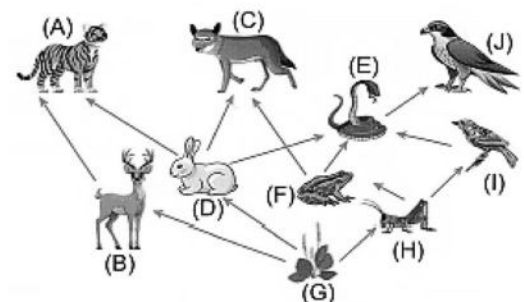
- a. The total distance.
- b. The displacement.

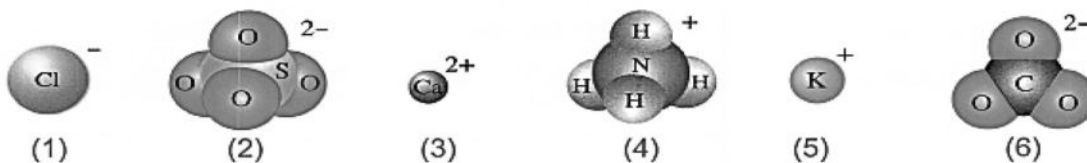
11. Complete the following diagram :**12. The opposite figure illustrates the composition of the bronze alloy:**

- (1) What are the elements (X) and (Y) ?
- (2) Why are alloys preferred to be used more than the pure metals ?

**13. From the given food web, indicate the letter(s) representing :**

1. The predators that occupy the top of the food chains.
2. Herbivores.
3. A consumer that is preyed by three different predators.
4. The producers.



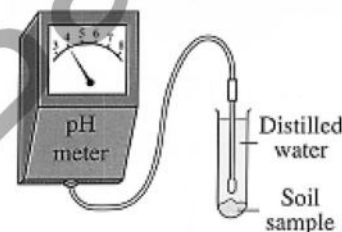
14. The following figures illustrate the ions of some elements and atomic groups:

Write the name and the molecular formula of the salt resulting from the combination of:

1. Ion (1) with Ion (5).
2. Ion (3) with Ion (2).
3. Ion (6) with Ion (4).

15. The device illustrated in the opposite figure is used to measure the acidity or basicity of agricultural soil :

1. What is the type of this soil? Explain.
2. How can this soil be treated ?

**16. Write the molecular formulas of the salts composed of the cations and anions:**

- | | |
|-----------------------------------|-----------------------------------|
| (1) K^+ , PO_4^{3-} | (2) Al^{3+} , SO_4^{2-} |
| (3) NH_4^+ , NO_3^- | (4) Mg^{2+} , CO_3^{2-} |
| (5) Na^+ , Cl^- | (6) Ba^{2+} , CO_3^{2-} |
| (7) NH_4^+ , Cl^- | (8) NH_4^+ , PO_4^{3-} |
| (9) Mg^{2+} , SO_4^{2-} | (10) Ag^+ , Cl^- |

17. Identify type of nutritional relationship between each pair of the following organisms:

1. Lion and zebra.
2. Dionaea plant and insect.
3. Bees and flowers of plants.
4. Panther chameleon and insect.
5. Plover bird and crocodile.
6. The wolf and the rabbit.

18. Write the chemical formula for each of the following:

1. Hydrobromic acid.
2. Nitric acid.
3. Lithium hydroxide.
4. Carbonic acid.
5. Sodium hydroxide.

19. Give one example for each of the following :

1. Chemical weathering.
2. A sedimentary rock.
3. A metamorphic rock.
4. A plutonic igneous rock.
5. A surface igneous rock.
6. A fossil fuel of plant organic origin.

20. Write the names of the following acids and alkalis :

1. H_2CO_3
2. HF
3. $\text{Mg}(\text{OH})_2$
4. LiOH
5. H_2SO_4
6. NH_4OH

***(10) Answer the following questions:**

1. **Calculate the weight of** a rock placed at 15 m height above ground, given that its potential energy is 4500 J.
.....
.....
.....
2. If work of 500 J is done to move an object over a certain displacement with a force of 25 N,
Calculate the displacement that the object covers.
.....
.....
.....
3. **Calculate the time** taken by a car moving at a speed of 40 m/s to cover a distance of 200 m.
.....
.....
.....
4. **Calculate the height of** an object of mass 6 kg above the ground when its potential energy is 180 J, knowing that the gravitational field intensity is 10 N/kg.
.....
.....
.....
5. **Calculate the speed of** an object with a mass of 20 kg and a kinetic energy of 250 J.
.....
.....
.....
6. **Calculate the mass of** an object moving at a speed of 10 m/s if its kinetic energy is 1000 J.
.....
.....
.....

Model answer

*(1) Write the scientific term:

1. Metallic bond	13. Basic oxide	23. Lithification	33. Chromosome	43. Centromere
2. Alloy	14. Kinetic energy	24. Atomic group	34. Mutation	44. Potential energy
3. Graphite	15. Mechanical energy	25. Mutualism	35. Igneous rock	45. Biotic population
4. Displacement	16. Distance	26. Commensalism	36. Plutonic igneous rock	46. Predation
5. Speed	17. pH	27. Producer	37. Decomposer	47. Ecosystem
6. Energy	18. pH meter	28. Mechanical weathering	38. Genetics	48. Consumer
7. Condensation	19. Evaporation	29. Chemical weathering	39. Spherical weathering	
8. Water cycle	20. Acidic oxides	30. Fossil fuel	40. Lava	
9. Transpiration	21. Acidic rains	31. Energy pyramid	41. Omnivores	
10. Metals	22. Sedimentary rocks	32. Reproduction	42. Rocks	
11. Precipitation				
12. Alkali				

*(2) Choose the right answer:

1. A	8. A	15. D	22. B	29. D	36. B	43. D	50. B
2. D	9. D	16. B	23. D	30. B	37. B	44. D	51. C
3. D	10. A	17. D	24. C	31. D	38. C	45. A	52. A
4. D	11. A	18. A	25. D	32. C	39. A	46. D	53. B
5. B	12. B	19. B	26. A	33. C	40. B	47. C	54. D
6. B	13. D	20. C	27. D	34. B	41. B	48. C	55. C
7. B	14. B	21. D	28. C	35. C	42. A	49. B	56. B

*(3) Put (✓) or (X) :

1. (X)	4. (X)	7. (X)	10. (X)	13. (X)	16. (X)	19. (X)	22. (✓)
2. (X)	5. (✓)	8. (✓)	11. (✓)	14. (X)	17. (X)	20. (X)	
3. (✓)	6. (✓)	9. (X)	12. (✓)	15. (X)	18. (X)	21. (✓)	

*(4) Complete the following:

1. Weight – height	10. Surface – plutonic	19. Condensation – evaporation – boiling	29. Mutualism – predation
2. 14 – 0	11. Acidic – basic	20. Large – small	30. Lose – gain
3. Kg – N	12. Increase	21. Mass - speed	31. Decrease – increase
4. Desalination	13. W * h – joule	22. Zero	32. Sun – consumer
5. Enzyme – chemical reaction – protein	14. Plant – microorganisms	23. H ⁺ - OH ⁻	33. Mechanical – chemical
6. NiCl ₂	15. H ⁺ - Br ⁻	24. Genetic	34. Nucleus – cytoplasm
7. Nonmetals – graphite	16. Producer – plant – decomposer	25. Km/h – m/s	35. Acid – base
8. Weathering – erosion	17. Metamorphic	26. Acid – alkali	36. Sedimentary – metamorphic
9. Chromosome – chromatid - centromere	18. Predation – predator – prey	27. 46	37. DNA – histone
		28. Plutonic – surface	38. NaOH – Acetic acid

*(5) Give reasons for:

- Because the mechanical energy is sum of potential and kinetic energy
- Because acid turns blue litmus paper into red , and alkalis turns red litmus paper into blue.
- Because the mass of the truck is greater than the mass of a car and as the kinetic energy increases, its mass increases
- Because it is composed of genes which are responsible for the appearance of the hereditary traits in the living organism
- Because as the number of valence electrons in the metal atom increases, the strength of its metallic bond also increases and melting point increase.
- Because the potential energy of the water held behind the dam is converted into kinetic energy then to electric energy
- Because the light energy of the Sun is converted into chemical energy stored in plants
- Because The number of hydroxide groups in the alkali molecule equals the magnitude of the charge of the cation (or the atomic group) that composes it
- Because it is used in different fields, such as drinking, agriculture, industry.
- Because it exists in the form of two strands twisted around each other, forming a double helix.
- Because ¹²Mg contain two electrons in the outermost energy level , while ¹⁶S contain six electrons in outermost energy level.
- Because As the number of valence electrons in the metal atom increases, the strength of its metallic bond also increases and hardness increase.
- Because the displacement is equal to zero
- Because They decompose (break down) the organic substances found in dead bodies.
- Because bronze alloy is more resistant to rusting.
- Because there is no change in the chemical structure of water.
- Because bees benefit by extracting nectar from the flowers, while the plants benefit from the transfer of their pollen grains
- Because the chemical energy found in food and fuel is potential energy stored in chemical bonds and converted into kinetic energy
- Because gabbro is formed as a result of the slow solidification of magma, while quartzite is formed due to exposure of rocks to pressure and heat.
- Because producers can make their own food through the photosynthesis process, while consumers depend directly or indirectly on producers to obtain their food.
- Because alloy is harder than pure metals.
- Because they feed of plants and animals.
- Graphite is the only good electrical conductor nonmetal.

*(6) **What happens when:**

1. It will form salt and water.
2. The piece of sulphur will be broken easily
3. The potential energy doubles.
4. It forms acidic solution
5. It forms acidic rains.
6. The object will move.
7. Its speed decreases
8. The kinetic energy of the object decreases to half.
9. The potential energy decreases gradually and the kinetic energy increases.
10. It will form alloy
11. It forms magnesium oxide (Basic oxide) which dissolves in water and form alkaline solution.
12. The potential energy decreases to half.
13. it causes the evolution of acidic oxides such as SO_2 and NO_2 , which make acidic rains.
14. Its kinetic energy becomes zero and its potential energy is at its maximum.
15. It forms alkaline solution
16. It forms Sulphur oxide (acidic oxide) which dissolves in water and form acidic solution.
17. The kinetic energy of the object increases to four times its value.
18. The melting point will increase.
19. Its kinetic energy is at its maximum and potential energy is zero.
20. The red litmus strip changes into blue.

*(7) **Choose from column (B) what suits it in column (A) :**

- | | | | | | |
|----|-----|-----|-----|-----|-----|
| 1. | 1.d | 2.c | 3.a | 4.e | 5.b |
| 2. | 1.b | 2.a | 3.e | 4.c | 5.d |
| 3. | 1.a | 2.b | 3.e | 4.c | 5.d |
| 4. | 1.c | 2.d | 3.a | 4.b | |

*(8) **Correct the underlined words :**

- | | | | |
|-----------------|-------------|-----------------|----------------|
| 1. Scavenger | 4. Enzyme | 7. Condensation | 10. Host |
| 2. Competition | 5. Freezing | 8. Mendel | 11. Decomposer |
| 3. Condensation | 6. Prey | 9. Evaporation | 12. Energy |

*(9) Problems:

1	1. 2 2. Bird – grass	2	1. Desalination of seawater. 2. 1. Fresh water 2. Salt water 3. Condensation
3	(1) The bulb remains lit/ Because graphite is a good conductor of electricity. (2) The bulb goes out/ Because sulphur is a bad conductor of electricity.	4	1. predation 2. chameleon benefit – insect harmed
5	1. A 2. A 3. B and C 4. B and C	6	1. A- Plutonic igneous rock B- Surface igneous rock 2. A- granite B- basalt
7	1. OH ⁻ 2. HCl 3. CO ₃ or SO ₄ ²⁻ 4. Acetic acid 5. Sodium hydroxide	8	A- evaporation B- condensation c- precipitation d- surface runoff
9	1. mutualism 2. both of them	10	a. = 7+2+4+3+3 = 19 m b. = 2+3 = 5 m
11	1. Melting 2. Evaporation 3. Condensation 4. Freezing	12	(1) * Element (X): Copper. * Element (Y): Tin. (2) Because alloys are harder than pure metals, which tend to be soft and often unfit for industrial uses.
13	1. A – C – J 2. H – D – B 3. D 4. G	14	(1) * Element ions: (1), (3), (5). * Atomic group ions: (2), (4), (6). (2) 1- Potassium chloride/ KCl 2- Calcium sulphate / CaSO ₄ 3- Ammonium carbonate / (NH ₄) ₂ CO ₃
15	1. acidic soil – because pH is less than 7 2. by adding alkaline substance.	16	1. K ₃ PO ₄ 2. Al ₂ (SO ₄) ₃ 3. NH ₄ NO ₃ 4. MgCO ₃ 5. NaCl 6. BaCO ₃ 7. NH ₄ Cl 8. (NH ₄) ₃ PO ₄ 9. MgSO ₄ 10. AgCl
17	1. Predation 2. Predation 3. Mutualism 4. Predation 5. Commensalism 6. Predation	18	1. HBr 2. HNO ₃ 3. LiOH 4. H ₂ CO ₃ 5. NaOH
19	1. Spherical weathering 2. Sandstone 3. Marble 4. Granit 5. Pumice 6. Coal	20	1. Carbonic acid 2. Hydrofluoric acid 3. Magnesium hydroxide 4. Lithium hydroxide 5. Sulphuric acid 6. Ammonium hydroxide

*(10) Answer the following questions:

1	$PE = w \times h$ $w = \frac{PE}{h} = \frac{4500}{15} = 300 \text{ m}$	2	$w = f \times s$ $s = \frac{w}{f} = \frac{500}{25} = 20 \text{ m}$
3	$t = \frac{d}{v} = \frac{200}{40} = 5 \text{ sec.}$	4	$PE = m \times g \times h$ $h = \frac{PE}{m \times g} = \frac{180}{6 \times 10} = 3 \text{ m}$
5	$KE = \frac{1}{2} m \times v^2$ $v = \sqrt{\frac{2KE}{m}} = \sqrt{\frac{2 \times 250}{20}} = 5 \text{ J}$	6	$KE = \frac{1}{2} m \times v^2$ $m = \frac{2KE}{v^2} = \frac{2 \times 1000}{10^2} = 20 \text{ m}$

حمل الآن

مجاناً وحصرياً

المراجعة رقم (5)

الترم الثاني



Final Revision

1) Choose the correct answer:

- 1- All the following are properties of sodium element, except.....
a) metal. b) has metallic luster.
c) bad electrical conductor. d) ductile and malleable.
- 2- The common property of both sodium and copper is.....
a) colour. b) density. c) melting point. d) physical state.
- 3- The liquid element which is bad conductor of electricity is.....
a) bromine. b) chlorine. c) mercury. d) lithium.
- 4- Sulphur element differs from calcium element in all the following, except.....
a) physical state. b) ductility and malleability.
c) thermal conductivity. d) metallic luster.
- 5- The hardest element of the following is.....
a) $_{13}\text{Al}$ b) $_{17}\text{Cl}$ c) $_{12}\text{Mg}$ d) $_{11}\text{Na}$
- 6- All the following elements don't contain a metallic bond, except.....
a) Carbon. b) Oxygen. c) Iron. d) Nitrogen.
- 7- The dissolution of sulphur trioxide (SO_3) in water forms.....
a) H_2SO_3 b) H_2SO_4 c) HSO_4 d) H_3SO_4
- 8- Acids can contain all the following atomic groups, except..... group.
a) carbonate b) sulphate c) nitrate d) hydroxide
- 9- All the following are negative atomic groups, except..... group.
a) ammonium b) sulphate c) nitrate d) carbonate
- 10- All the following are oxyacids, except.....
a) HClO_2 b) HNO_3 c) HCl d) H_2SO_4
- 11-is a strong acid.
a) Nitric acid b) Dilute acetic acid
c) Nitrous acid d) Sulphurous acid
- 12- The compound which is used in antacids is.....
a) MgCl_2 b) $\text{Mg}(\text{OH})_2$ c) H_2CO_3 d) NaCl
- 13- All the following are alkaline substances, except.....
a) Soap b) Toothpaste c) Potassium hydroxide d) Ketchup

14- Among the basic oxides is.....

- a) SO_2 b) SO_3 c) NO_2 d) Na_2O

15- Among the nonmetal oxides is.....

- a) MgO b) CaO c) Na_2O d) NO_2

16-oxides react together after dissolving in water.

- a) SO_2 , NO_2 b) CaO , MgO c) Na_2O , SO_2 d) Na_2O , CaO

17-is the scientist who developed pH scale to differentiate between acidic, basic and neutral solutions.

- a) Arrhenius b) Soren Sorensen c) Newton d) Mendel

18- The solution with pH equals 1 is.....

- a) strong alkali. b) weak alkali. c) strong acid. d) weak acid.

19- pH of acid rains can be equals.....

- a) 4 b) 7 c) 9 d) 11

20- The following substances have pH greater than 7, except.....

- a) oven cleaners. b) calcium hydroxide solution.
c) ammonia solution. d) grape juice.

21- All the following from ions that form salts, except.....

- a) OH^- b) Cl^- c) NH_4^+ d) NO_3^-

22- All the following salts dissolve in water, except.....

- a) sodium chloride. b) calcium sulphate.
c) magnesium chloride. d) silver nitrate.

23- The colour of the universal indicator strip doesn't change with.....

- a) sulphuric acid. b) lemon juice.
c) magnesium hydroxide. d) sodium chloride solution.

24- All of the following salts are sparingly soluble in water, except.....

- a) CaSO_4 b) $(\text{NH}_4)_2\text{CO}_3$ c) AgCl d) CuCO_3

25-is a solution with pH greater than 7.

- a) NH_4Cl b) NaCl c) Na_2CO_3 d) HCl

26- Salts differ in all the following properties, except.....

- a) physical state. b) colour.
c) pH value of their solutions. d) solubility in water.

- 27-** A body does work of 50J to move a bicycle a distance of 10m, so the amount of force required to do the work equals.....
- a) 500N b) 5N c) 60N d) 40N
- 28-** The product of multiplying the mass of the object and the Earth's gravitational field intensity is.....
- a) speed b) work c) weight d) potential energy
- 29-** All the following have the same measuring unit, except.....
- a) Distance b) Height c) Speed d) Displacement
- 30-** When the force acting on an object is doubled with constant displacement the work done will.....
- a) decrease to half. b) increase to double.
c) increase to four times. d) decrease to quarter.
- 31-** All the following are measuring units, except.....
- a) Newton b) Force c) Joule d) Kilogram
- 32-** A body with a mass of 10 kg moves at a speed of 3 m/s, so the kinetic energy equals.....
- a) 15 J b) 30 J c) 45 J d) 90 J
- 33-** If the speed of the body increases into three times with constant mass, its kinetic energy.....
- a) increases to double. b) increases to 3 times its value.
c) increases to 9 times its value. d) decreases to half its value.
- 34-** At the maximum height reached by an object thrown upwards,.....
- a) potential energy is zero. b) kinetic energy is zero.
c) mechanical energy is zero. d) the mass of the object is zero.
- 35-** The potential energy of the object is equal to kinetic energy.....
- a) at the moment of falling. b) at the maximum height.
c) at the moment it reaches the ground. d) at the midpoint.
- 36-**is the various populations of different species that inhabit the same environment.
- a) Individual b) Biotic population
c) Biological community d) Ecosystem

37- All of the following nutritional relationship results in harm to one of the individuals, except.....

- a) The falcon and mice.
- b) Spiders and insects.
- c) Dionea plant and insect.
- d) Nile crocodile and plover bird.

38- The nutritional relationship between ladybug and aphid insect is.....

- a) predation
- b) competition
- c) commensalism
- d) mutualism

39- Herbivores are.....

- a) producers.
- b) scavengers.
- c) consumers.
- d) decomposers.

40- The rabbit and the horse are considered from because they feed on plants only.

- a) herbivores
- b) carnivores
- c) omnivores
- d) scavengers

41-are characterized by the presence of sharp canines for tearing prey.

- a) herbivores
- b) carnivores
- c) omnivores
- d) scavengers

42- The amount of energy lost when moving from any trophic level to the next level in the energy pyramid equals.....

- a) 1 %
- b) 10 %
- c) 90 %
- d) 100 %

43- All of the following are classified as hereditary traits, except.....

- a) The length of a giraffe's neck.
- b) The spider weaving its net.
- c) Facial freckles.
- d) The short legs of the arctic fox.

44-is considered the founder of genetics.

- a) Beadle
- b) Tatum
- c) Newton
- d) Mendel

45- The two scientists who affirmed the hypothesis of one gene - one enzyme are.....

- a) Beadle and Mendel.
- b) Beadle and Tatum.
- c) Tatum and Mendel.
- d) Watson and Crick.

46- The production of seedless lemons is a result of.....mutation.

- a) spontaneous harmful
- b) spontaneous beneficial
- c) induced beneficial
- d) induced harmful

47- Production of featherless chickens is considered.....mutation.

- a) spontaneous
- b) lethal
- c) induced
- d) harmful

- 4- Allare bad conductors of electricity except forwhich is a good conductor of electricity.
- 5- The atoms of solid metals are arranged in a structure known as
- 6- The bronze alloy is composed ofat 95% andat 5%.
- 7- The bronze alloy is used in manufacturingand
- 8- The molecular formula of the carbonate group is, while the molecular formula of the sulphate group is
- 9- The bicarbonate group carrycharge, and its molecular formula is
- 10- The scientistclarified that acids are substances that dissolve in water and produce positiveions, while bases, when dissolved in water produce negativeions.
- 11-acids are those that contain oxygen element, whileacids don't contain oxygen element.
- 12- The number of hydrogen atoms in the acid molecule equals the magnitude of the charge of thethat forms it.
- 13- When hydrochloric acid dissolves in water, it producescation andanion.
- 14- The compound H_2S is known asin its gaseous state, while it is known as in its solution form.
- 15- The number of hydroxide groups in the alkali molecule equals the magnitude of the charge of thethat forms it.
- 16- provides the muscles with energy during their lack of oxygen, but its accumulation in the muscles causes
- 17- Lemon and ketchup are consideredsubstances, while toothpaste and baking soda are consideredsubstances.
- 18- Acids react with alkalis formingand
- 19-ions are responsible for all the properties of the acids, whileions are responsible for all the properties of the alkalis.
- 20- Nitric acid is aacid, while nitrous acid is aacid.
- 21- Sodium hydroxide is aelectrical conductor, while ammonium hydroxide is aelectrical conductor.

- 22- Oxides are divided intooxides and oxides.
- 23- Metal oxides can react with, but they don't react with
- 24- The combustion of fossil fuels producesoxides such asand
- 25- There are many indicators such asand
- 26-gas removes the colour of blue litmus strip wetted with water.
- 27- We can reduce soil acidity by addingmaterials such as.....
- 28- The pH value ofis less than 7, while that ofis greater than 7.
- 29- The strength of the acidic solution increases as its pH value approaches.....
- 30-are substances that are all solid, whose solutions and melts conduct electricity.
- 31- The combination of Mg^{2+} cation with CO_3^{2-} anion, forms a salt called and its molecular formula is
- 32- Sodium nitrate salt is composed ofcation derived from NaOH and nitrate anion derived fromacid.
- 33- The pH value of a table salt solution (sodium chloride) is
- 34- Salt melt iselectrical conductor, while distilled water iselectrical conductor.
- 35- From colored salts copper sulphate salt whose color is and the salt whose color is green.
- 36-chloride salt dissolve in water, while chloride salt doesn't dissolve in water.
- 37-andare the measuring units of speed.
- 38- A body moves at a speed of 20 km/h, so the distance travelled after three hours equals
- 39-is the ability to do work, and it is measured in
- 40- Energy has various forms including and
- 41- Thevariable is the variable to be tested, which changes in response to changing thevariable.

- 42-is the measuring unit of work, while
is the measuring unit of force.
- 43- Work = \times
- 44- If a force of 200 N acts on a car and does not move it from its position,
the work done on it equals
- 45- The potential energy of an object increases when its weight
- 46- Kinetic energy isproportional to mass and square of.....
- 47- At the maximum height of an object, its mechanical energy is equal to
.....energy only, while it is equal toenergy
only at the moment it reaches the ground surface.
- 48- When a ball falls vertically downwards, theenergy
decreases and theenergy increases.
- 49- Theenergy of water is used in operating turbines to
generatefrom the High Dam.
- 50- The ecosystem consists of and
- 51- The ecosystem consists of several levels which are the individual,
..... and.....
- 52- Non-living components in the ecosystem such asand
- 53- The beneficiary individual from predation relationship is called
....., while the beneficiary individual from commensalism
relationship is called
- 54- The nutritional relationship between the Egyptian plover birds and Nile
crocodiles is an example for
- 55-are animals feed on both meat and plants, such
as..... and
- 56-is the path of energy flow in the form of food as it
moves from one organism to another within the ecosystem.
- 57-are called autotrophic organisms, while.....
are called heterotrophic organisms.
- 58- Producers obtain energy from, while the.....
obtain their energy from producers.

- 59- The food chain begins withsuch as plants and ends withsuch as bacteria and
- 60- The base of the energy pyramid is occupied by, while its apex is occupied by the in the food chain.
- 61- The number of rabbits in a biological community when the number of predators decreases.
- 62- The patterns of food interactions among individuals of different biological communities include predation,, and
- 63- The bat sleeping upside down is classified as, while hair color is classified as
- 64- Genetic material is found in theof prokaryotic organisms and in theof eukaryotic organisms.
- 65- A chromosome is made up of twoconnected at the.....
- 66- The chromosome is chemically composed of aacid, wrapped around a type of protein known as
- 67- Each chromosome carries thousands or millions of which vary in number from one chromosome to another.
- 68- The nucleotides arranged in the form of two strands twisted around each other, forming what is known as the
- 69- Genetic traits are passed from parents to offspring through.....
- 70- The mixture used in separating strawberry chromosomes consists of..... andwith
- 71- DNA is composed of small segments called, each of them consists of a sequence of
- 72- Each gene produces a specific, which is responsible for occurrence of a that leads to the formation of a.....that expresses a specifictrait.
- 73-andare two processes that occur when losing heat.
- 74- Water changes from the liquid state to thestate when it gains energy.

- 75- Theprocess is the reverse of the freezing process, while evaporation process is the reverse of theprocess.
- 76- The basic stages of the water cycle are, condensation,, surface run off and
- 77- Theandare the two main factors maintain the continuity of the water cycle in nature.
- 78-is the process of breaking down and fragmenting rocks, whileis the transport of sediments from one location and their sedimentation in another.
- 79- Wind blowing is from causes ofweathering, while acid rains is from causes ofweathering.
- 80- The volume of waterwhen it freezes in the cracks of rocks, causingweathering.
- 81- The presence ofandmaterials in groundwater cause chemical weathering.
- 82- Rocks are classified according to the way of their formation intorocks,rocks androcks.
- 83-is the compaction of sediments over the years into layers formingrocks.
- 84-is formed by the transformation of limestone rock, whileis formed by the transformation of sandstone.
- 85-is the molten rocks in the Earth's interior, but when reaches the Earth's surface it called
- 86-rocks are formed from the solidification of lava or magma.
- 87- Igneous rocks are classified according to their locations of..... intoigneous rocks and igneous rocks.
- 88- Metamorphic rocks are transformed into igneous rocks throughandprocesses.
- 89- Basalt isigneous rock, while granite isigneous rock.
- 90-is used in the construction of the Pyramids of Giza, whileis used in the construction of the Taj Mahal in India.

91- Large plants represent the organic origin offuel, while marine microorganisms represent the organic origin of andfuels.

3) Write the scientific term:

- 1-** A liquid element with metallic luster.
- 2-** Elements that have metallic luster and are good conductors of heat and electricity.
- 3-** It inters in the composition of the bronze alloy with a small percentage.
- 4-** The process of the conversion of the wastes into new usable substances.
- 5-** A compound formed when an element burns in the presence of oxygen.
- 6-** Oxides produced from the burning of metals in the presence of oxygen.
- 7-** Nonmetal oxides that dissolve in water forming acids.
- 8-** Rains which result from the dissolution of acidic oxides in the atmospheric water vapour.
- 9-** Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion.
- 10-** The shortest straight path connecting between the starting point and the end point in a constant direction.
- 11-** The distance covered per unit of time.
- 12-** The amount of energy required to move an object through a certain displacement in the same direction of the force which acts on it.
- 13-** The variable that is changed during the experiment.
- 14-** The work done during the motion of an object.
- 15-** The summation of potential energy and kinetic energy of any moving object.
- 16-** Single living organism belonging to a specific species.
- 17-** The fundamental unit in the classification of living organisms.
- 18-** A nutritional relationship that benefits one organism, while the other organism neither benefits nor is harmed.

- 19- The organism that is neither benefited nor harmed in commensalism relationship.
- 20- The interconnection and overlapping of multiple food chains.
- 21- Behaviours and skills that are transmitted from parents to offspring without learning.
- 22- The science that studies the transmission of genetic traits from parents to offspring.
- 23- The central point at which the two chromatids of the chromosome are connected.
- 24- The smallest building units of nucleic acid DNA.
- 25- The emergence of a new trait that did not previously exist as a result of the change in the nature of the gene responsible for it.
- 26- The process leads to the disappearance of a water spot found on the surface of a house.
- 27- Water stored beneath the Earth's surface.
- 28- The process by which plants lose water in the form of water vapour.
- 29- The process of falling of water from clouds to the Earth's surface in form of rain, snow or hail due to the effect of the Earth's gravity.
- 30- Solid materials composed of one or several minerals.
- 31- Chemical weathering that leads to the formation of spheres of rocks.
- 32- Rock fragments transported away from the area in which weathering occurred.
- 33- Cohesive rocks formed from the lithification of sediments.
- 34- Rocks that contain fossils.

4) What is meant by:

1- Metallic bond.

➤

2- Alloys.

➤

3- Atomic group.

➤

4- Nonmetal oxides.

➤

5- Basic oxides.

➤

6- Indicators.

➤

7- The universal indicator.

➤

8- Potential of Hydrogen (pH value).

➤

9- The distance travelled by an object equals 10 meters.

➤

10- The speed of an object is 100 m/s.

➤

11- A moving car travels 720 meters in two minutes.

➤

12- Potential energy of a body equals 50 J.

➤

13- The acquired energy by an object as a result of its motion is 25 joule.

➤

14- Biotic population.

➤

15- Biological control. (mention example)

➤

16- Mutualism.

➤

17- Energy pyramid.

➤

18- Water cycle.

➤

19- Desalination of Seawater.

➤

20- Rock cycle.



.....

5) Put (\checkmark) or (x):

- 1- An element whose outermost energy level containing two electrons is a metal. ()
- 2- Lithium and sulphur can be differentiated by electrical conductivity. ()
- 3- The metallic bond exists between atoms of different metals. ()
- 4- Magnesium has lower melting point than sodium. ()
- 5- Pure gold metal is harder than gold alloys. ()
- 6- The total charge of molecules of any compound equals zero. ()
- 7- The molecular formula of bases that contain a cation Ca^{+2} is CaOH . ()
- 8- Acids can react with sodium hydroxide solution. ()
- 9- The molecular formula of the alkali ends with the symbol of OH^- anions. ()
- 10- The name of the acid is related to the name of the cation which composes it. ()
- 11- When acids dissolve in water, the percentage of OH^- ions in the solution increases. ()
- 12- Alkalis don't react with each other. ()
- 13- Acids and alkalis conduct electric current to variant degrees depending on their strength. ()
- 14- Acids can be differentiated from one to another according to their strength by using litmus indicator. ()
- 15- The pH value of the neutral solutions and distilled water is 7. ()
- 16- A solution with pH 13 is strong acid. ()
- 17- The strength of the alkaline solution increases as its pH value approaches 14. ()
- 18- Ca^{2+} ions combine with PO_4^{3-} ions forming a salt its molecular formula is Ca_3PO_4 . ()
- 19- Naming of the salt begins with the name of the cation followed by the name of the anion. ()
- 20- Solid salts and their melts conduct electricity. ()
- 21- All carbonate salts do not dissolve in water. ()
- 22- The salinity of the Dead Sea is almost 10 times higher than that of the Red sea. ()

- 23- Kilogram is the measuring unit of weight. ()
- 24- The potential energy of an object increases when its height decreases. ()
- 25- Joule = Newton x Metre. ()
- 26- The chemical energy present in food and fuel is stored potential energy. ()
- 27- The speed of pendulum ball is zero when it passes through its original position. ()
- 28- The decrease in potential energy is followed by a decrease in kinetic energy. ()
- 29- As the pendulum ball moves away from its original position, its potential energy gradually transforms into kinetic energy. ()
- 30- When lifting heavy objects, the load should be on the leg muscles rather than the back. ()
- 31- Hyenas and vultures are considered decomposers, as they feed on the remains of dead organisms. ()
- 32- Each stage in which energy is transferred in the food chain is called trophic level. ()
- 33- Energy flows from consumers to producers in the food web. ()
- 34- Decomposers in food chains recycle the nutrients to the ecosystem. ()
- 35- The food chain consists of several overlapped food webs. ()
- 36- All animals in food chains can play the roles of both predator and prey. ()
- 37- Inherited traits passed from offspring to parents. ()
- 38- Chromosomes are found in threads shape inside the nucleus. ()
- 39- The number of chromosomes in humans is 46 chromosomes, while in corn plant is 32 chromosomes. ()
- 40- Individuals of the same species have the same number of chromosomes in each of their somatic cells ()
- 41- Scoliosis (spinal deformity) is considered lethal mutation. ()
- 42- Production of cube-shaped watermelons is considered induced mutation. ()
- 43- An individual inherits half of its genetic material from the father and the other half from the mother. ()
- 44- People who suffer from lactose intolerance experience cramps and nausea when they eat meat. ()

- 45- Water evaporates upon losing heat. ()
- 46- The importance of the water cycle in nature is the renewal of water resources. ()
- 47- Evaporation occurs at a certain temperature, while boiling occurs at any temperature. ()
- 48- The rate of evaporation in tropical regions is faster than that in polar regions. ()
- 49- The boiling point is a characteristic property of pure substance. ()
- 50- When the temperature of the clouds is higher than the freezing point, snow precipitates instead of rain. ()
- 51- Water forms a comprehensive ecosystem, in which the various pathways periodically interact. ()
- 52- Water cycle in nature is a closed, multi-path cycle. ()
- 53- The principle of desalination relies on the processes of evaporation and condensation. ()
- 54- The minerals in rocks expand at night due to the decrease in temperature. ()
- 55- The hot springs of Yellowstone National Park are a good example of mechanical weathering. ()
- 56- Limestone is a sedimentary rock that is corroded by acidic rains. ()
- 57- Claystone resulting from compaction and lithification. ()
- 58- Quartzite is formed by the transformation of claystone. ()
- 59- Quartzite is harder than sandstone. ()

6) Correct the underlined words:

- 1- The strength of the metallic bond increases with increasing the number of neutrons.
- 2- Sulphur is used in dry cells.
- 3- The molecular formula of acids begins with the positive hydroxide cation.
- 4- The stomach secretes lactic acid which participates in food digestion.
- 5- When magnesium hydroxide dissolves in water, it forms hydrogen ion and magnesium ion.
- 6- Dissolving magnesium in water forms magnesium hydroxide.

- 7- Distilled water has a basic effect and does not change the color of litmus paper.
- 8- the molecular formula of aluminum sulphate is Al_2SO_4 .
- 9- CuSO_4 salt is green in colour and dissolves in water.
- 10- Joule is the measuring unit of distance and displacement.
- 11- Dependent variables remain constant throughout the experiment.
- 12- Work has the same unit of measurement as force.
- 13- An object whose mechanical energy is 50 J and its potential energy is 30 J, so its kinetic energy equals 80 J.
- 14- At the midpoint of the vertical distance between the falling point of a ball and the ground surface, the ratio of kinetic energy to potential energy equals 1:2.
- 15- The nutritional relationship which results in harm to both individuals is mutualism.
- 16- The nutritional relationship between *Dionaea* plant and insect is competition relationship.
- 17- The individual harmed in the predation is called the host.
- 18- Scavengers breaking down the wastes and the dead bodies into simpler substances that mix with the soil.
- 19- Each gene consists of a sequence of proteins.
- 20- Histones are carbohydrates.
- 21- Harmful mutations cause the appearance of desirable traits.
- 22- Production of wheat plants resistant to wheat rust disease is from spontaneous harmful mutations.
- 23- Evaporation of water occurs when it comes into contact with a cold surface.
- 24- Water transfers from the oceans to the air through surface runoff process.
- 25- Infiltration is the process of rainwater flowing across the Earth's surface and into rivers, seas and lakes due to the effect of the Earth's gravity.
- 26- From causes of mechanical weathering the growth of plant leaves within rock cracks.
- 27- Sedimentary rocks formed through the exposure of rocks located beneath the Earth's surface to pressure and heat without reaching their melting point.
- 28- Limestone is composed of sodium sulphate.

7) Cross out the odd word and write the scientific term of others:

1- Gold - Silver - Bromine – Mercury.

➤ Scientific term:

2- Magnesium – Copper – Mercury – Silver.

➤ Scientific term:

3- Phosphorus - Bromine - Mercury – Sulfur.

➤ Scientific term:

4- Graphite - Bromine - Phosphorus – Sulfur.

➤ Scientific term:

5- Iodine - Sulfur - Carbon – Hydrogen.

➤ Scientific term:

6- Cl^- – S^{2-} – P^{3-} – OH^- .

➤ Scientific term:

7- Hydroxide – Bicarbonate – Calcium – Phosphate.

➤ Scientific term:

8- HBr – H_2O – H_2CO_3 – HNO_3 .

➤ Scientific term:

9- Lemon – Baking soda – Ketchup – Grapes.

➤ Scientific term:

10- Hydrochloric acid – Nitric acid – Sulphuric acid – Sulphurous acid.

➤ Scientific term:

11- $\text{Ca}(\text{OH})_2$ – CO_2 – KOH – $\text{Mg}(\text{OH})_2$.

➤ Scientific term:

12- SO_2 – Cl_2 – CO_2 – NH_3 .

➤ Scientific term:

13- N_2 – H_2O – H_2 – HCl .

➤ Scientific term:

14- Universal indicator – litmus paper – voltameter – pH Meter.

➤ Scientific term:

15- Sodium hydroxide – Baking soda – Vinegar – Hand soap.

➤ Scientific term:

16- KOH – KNO₃ – ZnSO₄ – NaCl.

➤ Scientific term:

17- AgCl – CaSO₄ – CuCO₃ – NaNO₃.

➤ Scientific term:

18- Time – Mass – Speed – Distance.

➤ Scientific term:

19- Predation – Competition – Commensalism – Food chain.

➤ Scientific term:

20- Herbivores – Decomposers – Carnivores – Scavengers.

➤ Scientific term:

21- Reading – Blood type – Dolphin playing ball – Swimming.

➤ Scientific term:

22- Squirrel breaking a nut - Birds incubating eggs – Hair color – Breastfeeding.

➤ Scientific term:

23- Erosion – Evaporation – Precipitation – Infiltration.

➤ Scientific term:

24- Weathering – Precipitation – Erosion – Melting and crystallization.

➤ Scientific term:

25- Lithification – Fragmentation – Sedimentation – Crystallization.

➤ Scientific term:

26- Limestone – Marble – Sandstone – Claystone.

➤ Scientific term:

27- Gabbro – Pumice – Granite - Quartzite.

➤ Scientific term:

28- Basalt – Natural gas – Coal – Petroleum oil.

➤ Scientific term:

8) Mention the difference between (compare):

- 1- Phosphorus and iron in terms of (Type of element - Metallic luster – Conductivity of heat and electricity – Melting point).**
- 2- Mercury and bromine in terms of (Type of element - Physical state - Metallic luster).**
- 3- Acid and alkali in terms of (Definition – Effect on litmus strips – Examples).**
- 4- Basic oxides and acidic oxides in terms of (Definition – Examples).**
- 5- Potential energy and Kinetic energy in terms of (Definition – affecting factors – law used in calculation).**
- 6- The lion and the horse in terms of (type of food - shape of the teeth).**
- 7- Predation and Competition in terms of (Definition – Example).**
- 8- Hereditary traits and acquired traits in terms of (Definition – Examples).**
- 9- Spontaneous mutation and induced mutation in terms of (Definition – Examples).**
- 10- Evaporation and condensation in terms of definition.**
- 11- Mechanical and chemical weathering in terms of definition and causes.**
- 12- Marble and limestone in terms of (Type of rock - Way of formation).**
- 13- Plutonic igneous rocks and surface igneous rocks in terms of (Definition – Examples).**
- 14- Gabbro and pumice in terms of (type of rock – size of crystals).**

9) Give an example for:

- 1- Solid metal.**
- 2- Liquid nonmetal.**
- 3- Gaseous nonmetal.**
- 4- Alloy.**
- 5- Positive atomic group**
- 6- Atomic group carries three negative charges.**
- 7- Atomic group consisting of three elements.**
- 8- Oxygenated acid (oxyacid).**
- 9- Non-oxygenated acid.**
- 10- Acid secreted by the stomach.**

- 11-Weak acid.
- 12-Strong acid.
- 13-Weak alkali.
- 14-Strong alkali.
- 15-Metallic oxide.
- 16-Nonmetallic oxide.
- 17-A chemical indicator.
- 18-Acidic gas.
- 19-Basic gas.
- 20-Gas that has a neutral effect on litmus paper.
- 21-White salt.
- 22-Salt soluble in water.
- 23-Salt solution with pH less than 7.
- 24-Scavenger.
- 25-A hereditary trait in humans.
- 26-Harmful mutation in humans.
- 27-Fatal (lethal) mutation in humans.
- 28-Sedimentary rock.
- 29-Metamorphic rock.
- 30-Plutonic igneous rock.
- 31-Surface igneous rock.

10) Give reason for:

- 1- Calcium ($_{20}\text{Ca}$) is a metal, while chlorine ($_{17}\text{Cl}$) is a nonmetal.
➤
- 2- Graphite (carbon) is used in dry cells despite being nonmetal.
➤
- 3- Aluminum ($_{13}\text{Al}$) is harder and has a higher melting point than sodium ($_{11}\text{Na}$).
➤
- 4- Bronze alloy is used in the manufacture of medals instead of copper.
➤
- 5- Acids turn blue litmus paper into red.
➤

6- Alkalis turn red litmus paper into blue.

➤

7- Hydrochloric acid is a strong acid, while acetic acid is a weak acid.

➤

8- Milk of Magnesia is used to treat stomach acidity.

➤

9- Acid rains have severe harmful impacts on human and the environment in general.

➤

10- Acid rains cause an imbalance in aquatic ecosystems.

➤

11- Litmus paper is not suitable for distinguishing between strong and weak acids.

➤

12- Distilled water doesn't affect the color of litmus paper (neutral).

➤

13- The pH meter is more accurate than universal strips in determining the pH value of the solution.

➤

14- Oven cleaner is a basic substance, while milk is an acidic substance.

➤

15- The acidity of grapes is stronger than that of tomatoes.

➤

16- The alkalinity of laundry bleach is stronger than that of baking soda.

➤

17- It is not possible to drown in the Dead Sea.

➤

18- A person pushing against a wall does not perform work.

➤

19- The work done by the car is less than the work done by the truck, even though their speeds are equal.

➤

20- The kinetic energy of the car decreases when the driver presses the car's brakes.

➤

21- Increasing the work required to stop a moving car at a high speed.

➤

22- When a pendulum ball passes through the original position, its kinetic energy is at its maximum.

➤

23- The mechanical energy of an object falling from a height is constant despite the decrease in its potential energy.

➤

24- Demolition ball is an example of energy conversions.

➤

25- The nutritional relationship between bees and flowers of plant is a mutualistic relationship.

➤

26- The genes found on a single chromosome are different.

➤

27- DNA is known as a double helix.

➤

28- Mendel is considered the founder of genetics.

➤

29- Genes are responsible for the appearance of hereditary traits.

➤

30- Light skin color in people living in cold regions is a beneficial spontaneous mutation.

➤

31- Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.

➤

32- Lactose tolerance is considered a beneficial mutation.

➤

33- Fresh water consumption must be rationalized.

➤

34- Formation of water drops on the outer surface of a cup containing water and ice cubes.

➤

35- The boiling point is a characteristic property of pure substance not the evaporation process.

➤

36- The sun and gravity maintain the continuity of the water cycle.

➤

37- Desalination of sea and ocean water.

➤

38- The freezing of water causes cracks of rocks, leading to their break.

➤

39- Thermal expansion and contraction of the minerals that make up rocks.

➤

40- Acids and mineral substances are among the causes of chemical weathering.

➤

41- The hot springs of Yellowstone National Park in the United States are a good example of chemical weathering.

➤

42- Limestone is very important in the treatment of bone fractures.

➤

43- Erosion process is a double-edged sword.

➤

44- Sedimentary rocks are porous rocks.

➤

45- The crystals of granite can be distinguished by the naked eye, while that of basalt cannot be distinguished by the naked eye.

➤

11) What are the results of (What happens...)?

1- Knocking on a piece of graphite.

➤

2- Increasing the number of valence electrons in metal atoms according to the metallic bond.

➤

3- Mixing molten copper with molten tin.

➤

4- Combination of positive hydrogen cation with a negative bromide anion.

➤

5- The passage of electric current through sulphuric acid (or sodium hydroxide) according to lighting of the lamp.

➤

6- The passage of electric current through acetic acid (or ammonium hydroxide) according to lighting of the lamp.

➤

7- Reaction of acids with alkalis.

➤

8- Lactic acid accumulates in the muscles of the human body.

➤

9- Heating a piece of magnesium then adding water to the previous product then putting red litmus paper to the solution.

➤

10- Dissolution of sulphur oxide in rainwater.

➤

11- Fossil fuels burn in factories and cars.

➤

12- Putting a piece of sugar in a test tube containing sulphuric acid.

➤

13- Placing wet red and blue litmus paper in a tube of hydrogen gas.

➤

- 14- Placing wet red and blue litmus paper in a tube of chlorine gas.
➤
- 15- Placing litmus strips in a solution whose pH is 11.
➤
- 16- Adding each of nickel chloride salt and silver chloride salt separately to an amount of water with stirring.
➤
- 17- A moving car covers the same distance it travelled in half the time.
(Regarding its speed)
➤
- 18- The force decreases to half and the displacement is doubled.
(Regarding the work done)
➤
- 19- The height of the object above the surface of the ground is doubled with constant weight.
(Regarding its potential energy)
➤
- 20- The speed of a moving object is doubled with constant mass.
(Regarding its kinetic energy)
➤
- 21- The mass of a moving object decreases to half and its speed is doubled.
(Regarding its kinetic energy)
➤
- 22- Lack of food sources in a balanced ecosystem.
(Food shortage for a group of hyenas)
➤
- 23- Decomposers disappear from the ecosystem.
➤
- 24- The absence of any living organism from a balanced ecosystem.
➤
- 25- The increase in the number of primary consumers.
➤

26- Difference in the order of nucleotides in a single chromosome.

➤

27- A person suffering from lactose intolerance eats a piece of milk chocolate.

➤

28- Placing a cup of water in a sunny place for several hours.

➤

29- The cloud temperature is below freezing point.

➤

30- Small ice crystals gather during thunderstorms.

➤

31- The water cycle stops suddenly.

➤

32- Container filled with water up to its edge and placed in the refrigerator for several hours.

➤

33- Freezing of water in rock cracks.

➤

34- Adding drops of acid to a piece of limestone.

➤

35- The exposure of blocks of granite to chemical weathering.

➤

36- Increasing pressure on rock sediments.

➤

37- The exposure of sandstone to extreme pressure and heat.

➤

12) Complete the following table:

	Name of compound	Chemical formula	Type
1-	Hydrosulphuric acid	.....	Acid.
2-	.....	H_2SO_3	.....
3-	.....	H_2SO_4	Acid.
4-	Phosphoric acid	.....	Acid.
5-	Hydrogen iodide	.....	.....
6-	.....	H_2CO_3	Acid.
7-	.....	NH_4OH	.....
8-	Magnesium hydroxide	.....	Alkali.
9-	Magnesium oxide	.....	.....
10-	.....	SO_3	.....
11-	Ammonium sulphate	.....	.....
12-	.....	$CaBr_2$	Salt.
13-	Potassium phosphate	.....	.....
14-	Sodium carbonate	.....	.....
15-	.....	NH_4NO_3	.....

13) Problems:

- 1- A body moves (10 meters) east in (3 seconds), then moves (8 meters) north in (4 seconds), then moves (10 meters) west in (3 seconds). Calculate:
Total distance – Displacement – speed.
.....
.....
- 2- Calculate the speed of a body that covered a distance of 40 km in two hours.
.....
- 3- Calculate the time required to cover a distance of 3km if the body is moving at a speed of 20 m/s.
.....
- 4- A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.
.....
- 5- Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm. (knowing that the acceleration due to gravity is 10 N/kg)
.....

- 6- Calculate the weight of a body with a potential energy of 240 J at a height of 12 m.
.....
- 7- Calculate the height of an object of mass 6 kg above the ground when its potential energy 180 J.
(knowing that the gravitational field intensity is 10 N/kg)
.....
- 8- Calculate the mass of an object with kinetic energy 0.5 kJ moving at a speed of 5 m/s.
.....
.....
- 9- Calculate the speed of a ball with a mass of 2000 gm and a kinetic energy of 25 J.
.....
.....
- 10- Calculate the kinetic energy of a body weighing 20 N, moving at a speed of 3 m/s. (knowing that the acceleration due to gravity is 10 N/kg)
.....
- 11- Calculate the kinetic energy of a body with a mass of 500 g that covers a distance of 20 m in 5 s.
.....
.....
- 12- Calculate the mechanical energy of a moving object if its kinetic energy is 40J and its potential energy is 30 J.
.....
- 13- An object its mass is 10 kg is released to fall from a height of 4 m above the ground level. [Given that: Gravitational field intensity = 10 N/kg]
- a) Calculate the kinetic energy of the object in the following cases:
- 1) Just before falling.
 - 2) At the moment it reaches the ground.
- b) Calculate the mechanical energy of the object at the midpoint between the falling position and the ground.
.....
.....
.....

14- An object its mass is 600 g is thrown upwards vertically at a speed of 20 m/s. Calculate:

- a) The kinetic energy of the object at the moment of being thrown upwards.
b) The mechanical energy of the object at the maximum height it reaches.

.....
.....
.....

15- Calculate the amount of energy that transfers to the snake that is a tertiary consumer in a food chain, if the amount of energy at the first trophic level is 1000 energy units.

.....
.....

14) State one importance for each of the following:

- 1- Graphite:
2- Bronze alloy:
3- Stomach acid:
4- Lactic acid:
5- Milk of Magnesia (magnesium hydroxide):
6- pH meter device:
7- The demolition ball:
8- Decomposers in the ecosystem:
9- Producers in the food chain:
10- Bees in plant reproduction:
11- Chromosomes:
12- Genes:
13- Water cycle:
14- Wind in the water cycle in nature:
15- Living organisms in the water cycle:.....

15) Arrange each group according to what is required in the brackets :

1- $_{17}\text{X} - _{11}\text{Y} - _{13}\text{W} - _{12}\text{Z}$. (Descendingly according to hardness)

➤

2- Bacteria– Snake – Insect – Mouse – Plants – Hawk. (Form a food chain)

➤

3- Individual – Biocommunity – Biotic population – Ecosystem.
(starting from ecosystem)

➤

4- Precipitation – Evaporation – Condensation – Surface runoff.
(pathway of water cycle in nature)

5- Sand – Clay – Silt – Gravel. (Descendingly according to particles size)

➤

16) How to differentiate between:

1- Distilled water and hydrochloric acid.

➤

2- (CO_2 , O_2) gases.

➤

3- Ammonia gas and nitrogen dioxide gases.

➤

4- Nitric acid and nitrous acids.

➤

5- Ammonium chloride solution and sodium carbonate solution.

➤

17) When will it be:

1- The displacement of moving object is zero.

➤

2- Distance equals displacement.

➤

3- The speed is zero.

➤

4- Speed equals distance.

➤

5- The work is equal to zero.

➤

6- Potential energy equals zero.

➤

7- Kinetic energy equals zero.

➤

8- Kinetic energy numerically equals twice the mass of the body.

➤

18) State the number which indicates each of the following:

1- The percentage of copper in bronze alloy.

2- The percentage of tin in bronze alloy.

3- The number of elements in carbonate group.

4- The number of hydrogen cations that combine with one phosphate group to form phosphoric acid.

5- The percentage of energy transferred when moving from any trophic level to the next level in the energy pyramid.

6- The percentage of water in the human body.

7- The percentage of water in Earth's composition.

8- The percentage of land in the Earth's composition.

9- The percentage of fresh water compared to the percentage of water on Earth's surface.

10- The percentage of salt water compared to the percentage of water on Earth's surface.

11- The percentage of methane gas in the natural gas composition.

Final Revision (answered)

1) Choose the correct answer:

- 1- All the following are properties of sodium element, except.....
a) metal. b) has metallic luster.
c) bad electrical conductor. d) ductile and malleable.
- 2- The common property of both sodium and copper is.....
a) colour. b) density. c) melting point. d) physical state.
- 3- The liquid element which is bad conductor of electricity is.....
a) bromine. b) chlorine. c) mercury. d) lithium.
- 4- Sulphur element differs from calcium element in all the following, except.....
a) physical state. b) ductility and malleability.
c) thermal conductivity. d) metallic luster.
- 5- The hardest element of the following is.....
a) $_{13}\text{Al}$ b) $_{17}\text{Cl}$ c) $_{12}\text{Mg}$ d) $_{11}\text{Na}$
- 6- All the following elements don't contain a metallic bond, except.....
a) Carbon. b) Oxygen. c) Iron. d) Nitrogen.
- 7- The dissolution of sulphur trioxide (SO_3) in water forms.....
a) H_2SO_3 b) H_2SO_4 c) HSO_4 d) H_3SO_4
- 8- Acids can contain all the following atomic groups, except..... group.
a) carbonate b) sulphate c) nitrate d) hydroxide
- 9- All the following are negative atomic groups, except..... group.
a) ammonium b) sulphate c) nitrate d) carbonate
- 10- All the following are oxyacids, except.....
a) HClO_2 b) HNO_3 c) HCl d) H_2SO_4
- 11-is a strong acid.
a) Nitric acid b) Dilute acetic acid
c) Nitrous acid d) Sulphurous acid
- 12- The compound which is used in antacids is.....
a) MgCl_2 b) $\text{Mg}(\text{OH})_2$ c) H_2CO_3 d) NaCl
- 13- All the following are alkaline substances, except.....
a) Soap b) Toothpaste c) Potassium hydroxide d) Ketchup

14- Among the basic oxides is.....

- a) SO_2 b) SO_3 c) NO_2 d) Na_2O

15- Among the nonmetal oxides is.....

- a) MgO b) CaO c) Na_2O d) NO_2

16-oxides react together after dissolving in water.

- a) SO_2 , NO_2 b) CaO , MgO c) Na_2O , SO_2 d) Na_2O , CaO

17-is the scientist who developed pH scale to differentiate between acidic, basic and neutral solutions.

- a) Arrhenius b) Soren Sorensen c) Newton d) Mendel

18- The solution with pH equals 1 is.....

- a) strong alkali. b) weak alkali. c) strong acid. d) weak acid.

19- pH of acid rains can be equals.....

- a) 4 b) 7 c) 9 d) 11

20- The following substances have pH greater than 7, except.....

- a) oven cleaners. b) calcium hydroxide solution.
c) ammonia solution. d) grape juice.

21- All the following from ions that form salts, except.....

- a) OH^- b) Cl^- c) NH_4^+ d) NO_3^-

22- All the following salts dissolve in water, except.....

- a) sodium chloride. b) calcium sulphate.
c) magnesium chloride. d) silver nitrate.

23- The colour of the universal indicator strip doesn't change with.....

- a) sulphuric acid. b) lemon juice.
c) magnesium hydroxide. d) sodium chloride solution.

24- All of the following salts are sparingly soluble in water, except.....

- a) CaSO_4 b) $(\text{NH}_4)_2\text{CO}_3$ c) AgCl d) CuCO_3

25-is a solution with pH greater than 7.

- a) NH_4Cl b) NaCl c) Na_2CO_3 d) HCl

26- Salts differ in all the following properties, except.....

- a) physical state. b) colour.
c) pH value of their solutions. d) solubility in water.

- 27- A body does work of 50J to move a bicycle a distance of 10m, so the amount of force required to do the work equals.....
- a) 500N b) 5N c) 60N d) 40N
- 28- The product of multiplying the mass of the object and the Earth's gravitational field intensity is.....
- a) speed b) work c) weight d) potential energy
- 29- All the following have the same measuring unit, except.....
- a) Distance b) Height c) Speed d) Displacement
- 30- When the force acting on an object is doubled with constant displacement the work done will.....
- a) decrease to half. b) increase to double.
c) increase to four times. d) decrease to quarter.
- 31- All the following are measuring units, except.....
- a) Newton b) Force c) Joule d) Kilogram
- 32- A body with a mass of 10 kg moves at a speed of 3 m/s, so the kinetic energy equals.....
- a) 15 J b) 30 J c) 45 J d) 90 J
- 33- If the speed of the body increases into three times with constant mass, its kinetic energy.....
- a) increases to double. b) increases to 3 times its value.
c) increases to 9 times its value. d) decreases to half its value.
- 34- At the maximum height reached by an object thrown upwards,.....
- a) potential energy is zero. b) kinetic energy is zero.
c) mechanical energy is zero. d) the mass of the object is zero.
- 35- The potential energy of the object is equal to kinetic energy.....
- a) at the moment of falling. b) at the maximum height.
c) at the moment it reaches the ground. d) at the midpoint.
- 36-is the various populations of different species that inhabit the same environment.
- a) Individual b) Biotic population
c) Biological community d) Ecosystem

- 48- All of the following are sources of water vapor in nature except.....
 a) large water bodies. b) transpiration in plants.
 c) clouds. d) sweat secreted by human.
- 49- Clouds and rain are formed through the processes of.....
 a) condensation and precipitation. b) condensation and evaporation.
 c) evaporation and surface runoff. d) precipitation and surface runoff.
- 50-are the two processes that occur at any temperature.
 a) Melting and boiling. b) Evaporation and condensation.
 c) Condensation and boiling. d) Evaporation and boiling.
- 51- All the following factors lead to weathering, except.....
 a) wind blowing. b) acids present in groundwater.
 c) growth of plant roots within cracks. d) melting and crystallization.
- 52- Among the forms of the chemical weathering is.....
 a) weathering by water flow. b) weathering by plant roots.
 c) the spherical weathering. d) weathering by wind blowing.
- 53- River deltas are formed as a result of process.
 a) crystallization b) chemical weathering c) melting d) erosion
- 54- is used after being crushed to make casts.
 a) Gabbro. b) Limestone. c) Sandstone. d) Pumice.
- 55-is formed from the lithification of sediments.
 a) Quartzite. b) Pumice. c) Sandstone. d) Marble.
- 56- Metamorphic rocks are formed through the processes of.....
 a) melting and crystallization. b) heat and pressure.
 c) erosion and weathering. d) transportation and sedimentation.
- 57-is formed due to the exposure to extreme pressure and heat.
 a) Gabbro b) Pumice. c) Sandstone d) Marble

2) Complete the following statements:

- 1- Nonmetals are brittle elements that are not malleable or ductile.
- 2- The outermost energy level of metals contains less than 4 electrons, while nonmetals contain more than 4 electrons.
- 3- All metals are solids except for mercury which is a liquid.

- 4- All nonmetals are bad conductors of electricity except for graphite which is a good conductor of electricity.
- 5- The atoms of solid metals are arranged in a structure known as metallic crystal lattice.
- 6- The bronze alloy is composed of copper at 95% and tin at 5%.
- 7- The bronze alloy is used in manufacturing jewelry and medals.
- 8- The molecular formula of the carbonate group is CO_3^{2-} , while the molecular formula of the sulphate group is SO_4^{2-} .
- 9- The bicarbonate group carry one negative charge, and its molecular formula is HCO_3^- .
- 10- The scientist Arrhenius clarified that acids are substances that dissolve in water and produce positive hydrogen ions, while bases, when dissolved in water produce negative hydroxide ions.
- 11- Oxygenated acids are those that contain oxygen element, while non-oxygenated acids don't contain oxygen element.
- 12- The number of hydrogen atoms in the acid molecule equals the magnitude of the charge of the anion that forms it.
- 13- When hydrochloric acid dissolves in water, it produces hydrogen cation and chloride anion.
- 14- The compound H_2S is known as hydrogen sulphide in its gaseous state, while it is known as hydrosulphuric acid in its solution form.
- 15- The number of hydroxide groups in the alkali molecule equals the magnitude of the charge of the cation that forms it.
- 16- Lactic acid provides the muscles with energy during their lack of oxygen, but its accumulation in the muscles causes muscle cramps.
- 17- Lemon and ketchup are considered acidic substances, while toothpaste and baking soda are considered alkaline substances.
- 18- Acids react with alkalis forming salts and water.
- 19- Hydrogen ions are responsible for all the properties of the acids, while hydroxide ions are responsible for all the properties of the alkalis.
- 20- Nitric acid is a strong acid, while nitrous acid is a weak acid.

- 21- Sodium hydroxide is a good electrical conductor, while ammonium hydroxide is a bad electrical conductor.
- 22- Oxides are divided into metal (basic) oxides and nonmetal (acidic) oxides.
- 23- Metal oxides can react with acids, but they don't react with alkalis.
- 24- The combustion of fossil fuels produces acidic oxides such as nitrogen dioxide NO₂ and sulphur dioxide SO₂.
- 25- There are many indicators such as litmus paper and universal indicator.
- 26- Chlorine gas removes the colour of blue litmus strip wetted with water.
- 27- We can reduce soil acidity by adding basic materials such as calcium hydroxide Ca(OH)₂.
- 28- The pH value of acids is less than 7, while that of bases (alkalis) is greater than 7.
- 29- The strength of the acidic solution increases as its pH value approaches zero.
- 30- Salts are substances that are all solid, whose solutions and melts conduct electricity.
- 31- The combination of Mg²⁺ cation with CO₃²⁻ anion, forms a salt called magnesium carbonate and its molecular formula is MgCO₃.
- 32- Sodium nitrate salt is composed of sodium cation derived from NaOH and nitrate anion derived from nitric acid.
- 33- The pH value of a table salt solution (sodium chloride) is equal to 7.
- 34- Salt melt is good electrical conductor, while distilled water is bad electrical conductor.
- 35- From colored salts copper sulphate salt whose color is blue and the nickel chloride salt whose color is green.
- 36- Nickel chloride salt dissolve in water, while silver chloride salt doesn't dissolve in water.
- 37- m/s and km/h are the measuring units of speed.
- 38- A body moves at a speed of 20 km/h, so the distance travelled after three hours equals 60 km.

- 39- Energy is the ability to do work, and it is measured in joule.
- 40- Energy has various forms including potential energy and kinetic energy.
- 41- The dependent variable is the variable to be tested, which changes in response to changing the independent variable.
- 42- Joule is the measuring unit of work, while newton is the measuring unit of force.
- 43- Work = Force × Displacement.
- 44- If a force of 200 N acts on a car and does not move it from its position, the work done on it equals zero.
- 45- The potential energy of an object increases when its weight increases.
- 46- Kinetic energy is directly proportional to mass and square of speed.
- 47- At the maximum height of an object, its mechanical energy is equal to potential energy only, while it is equal to kinetic energy only at the moment it reaches the ground surface.
- 48- When a ball falls vertically downwards, the potential energy decreases and the kinetic energy increases.
- 49- The kinetic energy of water is used in operating turbines to generate electricity from the High Dam.
- 50- The ecosystem consists of biological community (or living organisms) and abiotic components (or non-living components).
- 51- The ecosystem consists of several levels which are the individual, biotic population and biological community.
- 52- Non-living components in the ecosystem such as water and air.
- 53- The beneficiary individual from predation relationship is called predator, while the beneficiary individual from commensalism relationship is called commensal.
- 54- The nutritional relationship between the Egyptian plover birds and Nile crocodiles is an example for commensalism.
- 55- Omnivores are animals feed on both meat and plants, such as bear and mouse.

- 56- Food chain is the path of energy flow in the form of food as it moves from one organism to another within the ecosystem.
- 57- Producers are called autotrophic organisms, while consumers are called heterotrophic organisms.
- 58- Producers obtain energy from the sun, while the consumers obtain their energy from producers.
- 59- The food chain begins with producers such as plants and ends with decomposer such as bacteria and fungi.
- 60- The base of the energy pyramid is occupied by producers, while its apex is occupied by the top predators (or the last consumer) in the food chain.
- 61- The number of rabbits in a biological community increases when the number of predators decreases.
- 62- The patterns of food interactions among individuals of different biological communities include predation, competition, commensalism and mutualism.
- 63- The bat sleeping upside down is classified as instinctive behavior, while hair color is classified as genetic (hereditary) traits.
- 64- Genetic material is found in the cytoplasm of prokaryotic organisms and in the nuclei of eukaryotic organisms.
- 65- A chromosome is made up of two chromatids connected at the centromere.
- 66- The chromosome is chemically composed of a nucleic acid, wrapped around a type of protein known as histones.
- 67- Each chromosome carries thousands or millions of genes which vary in number from one chromosome to another.
- 68- The nucleotides arranged in the form of two strands twisted around each other, forming what is known as the double helix.
- 69- Genetic traits are passed from parents to offspring through genes.
- 70- The mixture used in separating strawberry chromosomes consists of dishwashing liquid and table salt with water.
- 71- DNA is composed of small segments called genes, each of them consists of a sequence of nucleotides.

- 72- Each gene produces a specific enzyme, which is responsible for occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.
- 73- Freezing and condensation are two processes that occur when losing heat.
- 74- Water changes from the liquid state to the gas state when it gains energy.
- 75- The melting process is the reverse of the freezing process, while evaporation process is the reverse of the condensation process.
- 76- The basic stages of the water cycle are evaporation, condensation, precipitation, surface run off and infiltration.
- 77- The sun and gravity are the two main factors maintain the continuity of the water cycle in nature.
- 78- Weathering is the process of breaking down and fragmenting rocks, while erosion is the transport of sediments from one location and their sedimentation in another.
- 79- Wind blowing is from causes of mechanical weathering, while acid rains is from causes of chemical weathering.
- 80- The volume of water increases when it freezes in the cracks of rocks, causing mechanical weathering.
- 81- The presence of acids and mineral materials in groundwater cause chemical weathering.
- 82- Rocks are classified according to the way of their formation into sedimentary rocks, igneous rocks and metamorphic rocks.
- 83- Lithification is the compaction of sediments over the years into layers forming sedimentary rocks.
- 84- Marble is formed by the transformation of limestone rock, while quartzite is formed by the transformation of sandstone.
- 85- Magma is the molten rocks in the Earth's interior, but when reaches the Earth's surface it called lava.
- 86- Igneous rocks are formed from the solidification of lava or magma.

- 87- Igneous rocks are classified according to their locations of solidification into plutonic igneous rocks and surface igneous rocks.
- 88- Metamorphic rocks are transformed into igneous rocks through melting and crystallization processes.
- 89- Basalt is surface igneous rock, while granite is plutonic igneous rock.
- 90- Limestone is used in the construction of the Pyramids of Giza, while marble is used in the construction of the Taj Mahal in India.
- 91- Large plants represent the organic origin of coal fuel, while marine microorganisms represent the organic origin of petroleum oil and natural gas fuels.

3) Write the scientific term:

- | | |
|---|------------------------|
| 1- A liquid element with metallic luster. | (Mercury) |
| 2- Elements that have metallic luster and are good conductors of heat and electricity. | (Metals) |
| 3- It inters in the composition of the bronze alloy with a small percentage. | (Tin) |
| 4- The process of the conversion of the wastes into new usable substances. | (Recycling) |
| 5- A compound formed when an element burns in the presence of oxygen. | (Oxide) |
| 6- Oxides produced from the burning of metals in the presence of oxygen. | (Metal oxides) |
| 7- Nonmetal oxides that dissolve in water forming acids. | (Acidic oxides) |
| 8- Rains which result from the dissolution of acidic oxides in the atmospheric water vapour. | (Acid rains) |
| 9- Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion. | (Salt) |
| 10- The shortest straight path connecting between the starting point and the end point in a constant direction. | (Displacement) |
| 11- The distance covered per unit of time. | (Speed) |
| 12- The amount of energy required to move an object through a certain displacement in the same direction of the force which acts on it. | (Work) |
| 13- The variable that is changed during the experiment. | (Independent variable) |

- 14- The work done during the motion of an object. (Kinetic energy)
- 15- The summation of potential energy and kinetic energy of any moving object. (Mechanical energy)
- 16- Single living organism belonging to a specific species. (Individual)
- 17- The fundamental unit in the classification of living organisms. (Species)
- 18- A nutritional relationship that benefits one organism, while the other organism neither benefits nor is harmed. (Commensalism)
- 19- The organism that is neither benefited nor harmed in commensalism relationship. (Host)
- 20- The interconnection and overlapping of multiple food chains. (Food web)
- 21- Behaviours and skills that are transmitted from parents to offspring without learning. (Instinctive behaviors)
- 22- The science that studies the transmission of genetic traits from parents to offspring. (Genetics)
- 23- The central point at which the two chromatids of the chromosome are connected. (Centromere)
- 24- The smallest building units of nucleic acid DNA. (Nucleotides)
- 25- The emergence of a new trait that did not previously exist as a result of the change in the nature of the gene responsible for it. (Mutation)
- 26- The process leads to the disappearance of a water spot found on the surface of a house. (Evaporation)
- 27- Water stored beneath the Earth's surface. (Groundwater)
- 28- The process by which plants lose water in the form of water vapour. (Transpiration)
- 29- The process of falling of water from clouds to the Earth's surface in form of rain, snow or hail due to the effect of the Earth's gravity. (Precipitation)
- 30- Solid materials composed of one or several minerals. (Rocks)
- 31- Chemical weathering that leads to the formation of spheres of rocks. (Spherical weathering)
- 32- Rock fragments transported away from the area in which weathering occurred. (Sediments)
- 33- Cohesive rocks formed from the lithification of sediments. (Sedimentary rocks)
- 34- Rocks that contain fossils. (Sedimentary rocks)

4) What is meant by:

1- Metallic bond.

- It is the attraction force between the positive metal ions and the negative valence electron cloud which surrounds them.

2- Alloys.

- They are mixtures composed of two or more molten metals.

3- Atomic group.

- It is an ion composed of more than one atom of more than one element.

4- Nonmetal oxides.

- Oxides produced from the burning of nonmetals in the presence of oxygen.

5- Basic oxides.

- Metal oxides which dissolve in water forming alkalis.

6- Indicators.

- They are substances whose colour differs in acidic medium from that in alkaline medium.

7- The universal indicator.

- It is an indicator that can differentiate between acids and alkalis, or between different acids, or different alkalis, according to their strength.

8- Potential of Hydrogen (pH value).

- It is a scale ranges between the values 0 to 14, used to determine the acidity and the basicity of solutions.

9- The distance travelled by an object equals 10 meters.

- This means that the total length of path taken by the object during its moving from the starting point to the end point is 10 meters.

10- The speed of an object is 100 m/s.

- This means that the object covers a distance of 100m in 1s.

11- A moving car travels 720 meters in two minutes.

- This means that the speed of the car equals 6 m/s ($720 \div 120 = 6$).

12- Potential energy of a body equals 50 J.

- This means that energy stored in the body as a result of work done is 50J.

- 13-** The acquired energy by an object as a result of its motion is 25 joule.
 ➤ This means that the kinetic energy of this object is 25 joule.
- 14-** Biotic population.
 ➤ A group of individuals of the same species that live in a particular place at the same time.
- 15-** Biological control. (mention example)
 ➤ It is a food system that utilizes living organisms to eliminate agricultural pests instead of using pesticides.
 ➤ Ex. the use of dotted beetles to feed on aphids insects.
- 16-** Mutualism.
 ➤ It is a nutritional relationship between two individuals where they benefit from each other without causing harm to either of them.
- 17-** Energy pyramid.
 ➤ A pyramid represents the flow of energy and its amounts between the different trophic levels in any food chain.
- 18-** Water cycle.
 ➤ It is a natural process that involves the movement of water between the atmosphere and the Earth in a closed, multi-path cycle.
- 19-** Desalination of Seawater.
 ➤ It is the process of removing dissolved salts from seawater to convert it to fresh water.
- 20-** Rock cycle.
 ➤ It is the transformation of rocks from one type to another.

5) Put (✓) or (x):

- 1-** An element whose outermost energy level containing two electrons is a metal. (✓)
- 2-** Lithium and sulphur can be differentiated by electrical conductivity. (✓)
- 3-** The metallic bond exists between atoms of different metals. (x)
- 4-** Magnesium has lower melting point than sodium. (x)
- 5-** Pure gold metal is harder than gold alloys. (x)
- 6-** The total charge of molecules of any compound equals zero. (✓)

- 7- The molecular formula of bases that contain a cation Ca^{+2} is CaOH . (x)
- 8- Acids can react with sodium hydroxide solution. (✓)
- 9- The molecular formula of the alkali ends with the symbol of OH^- anions. (✓)
- 10- The name of the acid is related to the name of the cation which composes it. (x)
- 11- When acids dissolve in water, the percentage of OH^- ions in the solution increases. (x)
- 12- Alkalis don't react with each other. (✓)
- 13- Acids and alkalis conduct electric current to variant degrees depending on their strength. (✓)
- 14- Acids can be differentiated from one to another according to their strength by using litmus indicator. (x)
- 15- The pH value of the neutral solutions and distilled water is 7. (✓)
- 16- A solution with pH 13 is strong acid. (x)
- 17- The strength of the alkaline solution increases as its pH value approaches 14. (✓)
- 18- Ca^{2+} ions combine with PO_4^{3-} ions forming a salt its molecular formula is Ca_3PO_4 . (x)
- 19- Naming of the salt begins with the name of the cation followed by the name of the anion. (✓)
- 20- Solid salts and their melts conduct electricity. (x)
- 21- All carbonate salts do not dissolve in water. (x)
- 22- The salinity of the Dead Sea is almost 10 times higher than that of the Red sea. (✓)
- 23- Kilogram is the measuring unit of weight. (x)
- 24- The potential energy of an object increases when its height decreases. (x)
- 25- Joule = Newton x Metre. (✓)
- 26- The chemical energy present in food and fuel is stored potential energy. (✓)
- 27- The speed of pendulum ball is zero when it passes through its original position. (x)
- 28- The decrease in potential energy is followed by a decrease in kinetic energy. (x)
- 29- As the pendulum ball moves away from its original position, its potential energy gradually transforms into kinetic energy. (x)

- 30- When lifting heavy objects, the load should be on the leg muscles rather than the back. (✓)
- 31- Hyenas and vultures are considered decomposers, as they feed on the remains of dead organisms. (x)
- 32- Each stage in which energy is transferred in the food chain is called trophic level. (✓)
- 33- Energy flows from consumers to producers in the food web. (x)
- 34- Decomposers in food chains recycle the nutrients to the ecosystem. (✓)
- 35- The food chain consists of several overlapped food webs. (x)
- 36- All animals in food chains can play the roles of both predator and prey. (x)
- 37- Inherited traits passed from offspring to parents. (x)
- 38- Chromosomes are found in threads shape inside the nucleus. (✓)
- 39- The number of chromosomes in humans is 46 chromosomes, while in corn plant is 32 chromosomes. (x)
- 40- Individuals of the same species have the same number of chromosomes in each of their somatic cells (✓)
- 41- Scoliosis (spinal deformity) is considered lethal mutation. (x)
- 42- Production of cube-shaped watermelons is considered induced mutation. (x)
- 43- An individual inherits half of its genetic material from the father and the other half from the mother. (✓)
- 44- People who suffer from lactose intolerance experience cramps and nausea when they eat meat. (x)
- 45- Water evaporates upon losing heat. (x)
- 46- The importance of the water cycle in nature is the renewal of water resources. (✓)
- 47- Evaporation occurs at a certain temperature, while boiling occurs at any temperature. (x)
- 48- The rate of evaporation in tropical regions is faster than that in polar regions. (✓)
- 49- The boiling point is a characteristic property of pure substance. (✓)
- 50- When the temperature of the clouds is higher than the freezing point, snow precipitates instead of rain. (x)
- 51- Water forms a comprehensive ecosystem, in which the various pathways periodically interact. (✓)

- 52- Water cycle in nature is a closed, multi-path cycle. (✓)
- 53- The principle of desalination relies on the processes of evaporation and condensation. (✓)
- 54- The minerals in rocks expand at night due to the decrease in temperature. (x)
- 55- The hot springs of Yellowstone National Park are a good example of mechanical weathering. (x)
- 56- Limestone is a sedimentary rock that is corroded by acidic rains. (✓)
- 57- Claystone resulting from compaction and lithification. (✓)
- 58- Quartzite is formed by the transformation of claystone. (x)
- 59- Quartzite is harder than sandstone. (✓)
- *****

6) Correct the underlined words:

- 1- The strength of the metallic bond increases with increasing the number of neutrons. (valence electrons)
- 2- Sulphur is used in dry cells. (Graphite)
- 3- The molecular formula of acids begins with the positive hydroxide cation. (hydrogen)
- 4- The stomach secretes lactic acid which participates in food digestion. (hydrochloric acid)
- 5- When magnesium hydroxide dissolves in water, it forms hydrogen ion and magnesium ion. (hydroxide)
- 6- Dissolving magnesium in water forms magnesium hydroxide. (magnesium oxide)
- 7- Distilled water has a basic effect and does not change the color of litmus paper. (neutral)
- 8- the molecular formula of aluminum sulphate is Al₂SO₄. $Al_2(SO_4)_3$
- 9- CuSO₄ salt is green in colour and dissolves in water. (NiCl₂)
- 10- Joule is the measuring unit of distance and displacement. (meter)
- 11- Dependent variables remain constant throughout the experiment. (Controlled)
- 12- Work has the same unit of measurement as force. (Weight)
- 13- An object whose mechanical energy is 50 J and its potential energy is 30 J, so its kinetic energy equals 80 J. (20J)

- 14- At the midpoint of the vertical distance between the falling point of a ball and the ground surface, the ratio of kinetic energy to potential energy equals 1:2. (1:1)
- 15- The nutritional relationship which results in harm to both individuals is mutualism. (competition)
- 16- The nutritional relationship between *Dionaea* plant and insect is competition relationship. (predation)
- 17- The individual harmed in the predation is called the host. (prey)
- 18- Scavengers breaking down the wastes and the dead bodies into simpler substances that mix with the soil. (Decomposers)
- 19- Each gene consists of a sequence of proteins. (nucleotides)
- 20- Histones are carbohydrates. (proteins)
- 21- Harmful mutations cause the appearance of desirable traits. (Beneficial)
- 22- Production of wheat plants resistant to wheat rust disease is from spontaneous harmful mutations. (induced beneficial)
- 23- Evaporation of water occurs when it comes into contact with a cold surface. (Condensation)
- 24- Water transfers from the oceans to the air through surface runoff process. (evaporation)
- 25- Infiltration is the process of rainwater flowing across the Earth's surface and into rivers, seas and lakes due to the effect of the Earth's gravity. (Surface run off)
- 26- From causes of mechanical weathering the growth of plant leaves within rock cracks. (roots)
- 27- Sedimentary rocks formed through the exposure of rocks located beneath the Earth's surface to pressure and heat without reaching their melting point. (Metamorphic)
- 28- Limestone is composed of sodium sulphate. (calcium carbonate)

7) Cross out the odd word and write the scientific term of others:

- 1- Gold - Silver - Bromine – Mercury.
➤ Scientific term: Metals.
- 2- Magnesium – Copper – Mercury – Silver.
➤ Scientific term: solid metals

3- Phosphorus - Bromine - Mercury – Sulfur.

➤ Scientific term: Nonmetals.

4- Graphite - Bromine - Phosphorus – Sulfur.

➤ Scientific term: solid nonmetals (another answer: Graphite/ bad electrical conductor nonmetals).

5- Iodine - Sulfur - Carbon – Hydrogen.

➤ Scientific term: bad electrical conductor nonmetals.

6- Cl^- – S^{2-} – P^{3-} – OH^- .

➤ Scientific term: Nonmetal element anions.

7- Hydroxide – Bicarbonate – Calcium – Phosphate.

➤ Scientific term: negative atomic groups.

8- HBr – H_2O – H_2CO_3 – HNO_3 .

➤ Scientific term: Acids.

9- Lemon – Baking soda – Ketchup – Grapes.

➤ Scientific term: Acidic substances.

10- Hydrochloric acid – Nitric acid – Sulphuric acid – Sulphurous acid.

➤ Scientific term: strong acids.

11- $\text{Ca}(\text{OH})_2$ – CO_2 – KOH – $\text{Mg}(\text{OH})_2$.

➤ Scientific term: Alkalis.

12- SO_2 – Cl_2 – CO_2 – NH_3 .

➤ Scientific term: Gases change the colour of the indicator.

13- N_2 – H_2O – H_2 – HCl .

➤ Scientific term: substances don't change the colour of the indicator.

14- Universal indicator – litmus paper – voltameter – pH Meter.

➤ Scientific term: Indicators for testing the acidity or basicity.

15- Sodium hydroxide – Baking soda – Vinegar – Hand soap.

➤ Scientific term: Basic (alkaline) substances.

16- KOH – KNO_3 – ZnSO_4 – NaCl .

➤ Scientific term: Salts.

17- AgCl – CaSO_4 – CuCO_3 – NaNO_3 .

➤ Scientific term: Insoluble Salts.

18- Time – Mass – Speed – Distance.

➤ Scientific term: law of speed (speed = distance ÷ time).

19- Predation – Competition – Commensalism – Food chain.

➤ Scientific term: Nutritional relationships among individuals.

20- Herbivores – Decomposers – Carnivores – Scavengers.

➤ Scientific term: Consumers.

21- Reading – Blood type – Dolphin playing ball – Swimming.

➤ Scientific term: Acquired traits.

22- Squirrel breaking a nut - Birds incubating eggs – Hair color – Breastfeeding.

➤ Scientific term: Instinctive behaviors.

23- Erosion – Evaporation – Precipitation – Infiltration.

➤ Scientific term: processes of water cycle.

24- Weathering – Precipitation – Erosion – Melting and crystallization.

➤ Scientific term: geological processes affect rocks formation.

25- Lithification – Fragmentation – Sedimentation – Crystallization.

➤ Scientific term: Sedimentary rocks formation.

26- Limestone – Marble – Sandstone – Claystone.

➤ Scientific term: Sedimentary rocks.

27- Gabbro – Pumice – Granite - Quartzite.

➤ Scientific term: Igneous rocks.

28- Basalt – Natural gas – Coal – Petroleum oil.

➤ Scientific term: fossil fuels.

8) Mention the difference between (compare):

1- Phosphorus and iron in terms of (Type of element - Metallic luster – Conductivity of heat and electricity – Melting point).

P.O.C.	Phosphorus	Iron
Type	Nonmetal.	Metal.
Metallic luster	It doesn't have metallic luster (opaque).	It has metallic luster (shiny).
Conductivity	Bad.	Good.
Melting point	Low.	High.

2- Mercury and bromine in terms of (Type of element - Physical state - Metallic luster).

P.O.C.	Bromine	Mercury
Type	Nonmetal.	Metal.
Physical state	Liquid.	Liquid.
Metallic luster	It doesn't have metallic luster (opaque).	It has metallic luster (shiny).

3- Acid and alkali in terms of (Definition – Effect on litmus strips – Examples).

P.O.C.	Acid	Alkali
Definition	Substances that dissolve in water and give positive hydrogen ions (H ⁺).	Substances that dissolve in water and give negative hydroxide ions (OH ⁻).
Effect on litmus strips	They turn blue litmus strip to red.	They turn red litmus strip to blue.
Examples	Hydrochloric acid and nitric acid.	Magnesium hydroxide - ammonium hydroxide.

4- Basic oxides and acidic oxides in terms of (Definition – Examples).

P.O.C.	Acidic oxides	Basic oxides
Definition	Nonmetal oxides that dissolve in water forming acids.	Metal oxides, some of which dissolve in water forming alkalis.
Examples	Sulphur trioxide SO ₃ .	Magnesium oxide MgO.

5- Potential energy and Kinetic energy in terms of (Definition – affecting factors – law used in calculation).

P.O.C.	Potential energy	Kinetic energy
Definition	The stored energy in the object, as a result of the work done on it.	The acquired energy by an object as a result of its motion.
Affecting factors	1) Weight of the object (w). 2) Height (h).	1) Mass of the object (m). 2) Speed of the object (v).
Law used	PE = w × h	KE = $\frac{1}{2}mv^2$

6- The lion and the horse in terms of (type of food - shape of the teeth).

P.O.C.	Lion	Horse
Type of food	Feed on meat only (carnivores).	Feed on plants only (herbivores).
Shape of the teeth	Sharp canines for tearing prey.	Incisors for cutting plants.

7- Predation and Competition in terms of (Definition – Example).

P.O.C.	Predation	Competition
Definition	It is a nutritional relationship between two individuals, which are predator and prey, that results in harm to one individual (prey).	It is a nutritional relationship between two individuals of the same species compete for a food resource that exists in limited quantities and results in harm to both individuals.
Example	Predation of a zebra by a lion.	Competition between two lions for zebra.

8- Hereditary traits and acquired traits in terms of (Definition – Examples).

P.O.C.	Hereditary traits	Acquired traits
Definition	traits that are transmitted from parents to offspring without learning and are inherited from one generation to the next.	traits that are not inherited from parents but are acquired from the surrounding environment through learning or training and do not pass from one generation to another.
Example	Hair and eye colour.	Learning languages.

9- Spontaneous mutation and induced mutation in terms of (Definition – Examples).

P.O.C.	Spontaneous mutation	Induced mutation
Definition	Mutations occur naturally without human intervention.	Mutations that occur through human intervention.
Example	Albino mutation.	Production of featherless chickens.

10- Evaporation and condensation in terms of definition.

P.O.C.	Evaporation	Condensation
Definition	The conversion of water from the liquid state to the gaseous state upon gaining heat at any temperature.	The conversion of water from the gaseous state to the liquid state upon losing heat at any temperature.

11- Mechanical and chemical weathering in terms of definition and causes.

P.O.C.	Mechanical weathering	Chemical weathering
Definition	It is the process of breaking and fragmenting the rocks without any change in their chemical structure.	It is the process of breaking down and fragmenting rocks with a change in their chemical structure.
Causes	The flow of water. The wind blowing.	Chemical substances such as acids and acid rains.

12- Marble and limestone in terms of (Type of rock - Way of formation).

P.O.C.	Marble	Limestone
Type	Metamorphic rock.	Sedimentary rock.
Way of formation	Metamorphism of limestone through exposure to pressure and heat.	Weathering and erosion of rocks then lithification.

13- Plutonic igneous rocks and surface igneous rocks in terms of (Definition – Examples).

P.O.C.	Plutonic igneous rocks	Surface igneous rocks
Definition	Rocks formed from the slow cooling of magma in the cracks of the Earth's crust.	Rocks formed from the rapid cooling of lava on the surface of the Earth's crust.
Example	Granite and gabbro.	Basalt and pumice.

14- Gabbro and pumice in terms of (type of rock – size of crystals).

P.O.C.	Gabbro	Pumice
Type	Plutonic igneous rock.	Surface igneous rock.
Crystals	Large.	Small.

9) Give an example for:

1- Solid metal.

2- Liquid nonmetal.

(Gold)
(Bromine)

- 3- Gaseous nonmetal.
- 4- Alloy.
- 5- Positive atomic group
- 6- Atomic group carries three negative charges.
- 7- Atomic group consisting of three elements.
- 8- Oxygenated acid (oxyacid).
- 9- Non-oxygenated acid.
- 10- Acid secreted by the stomach.
- 11- Weak acid.
- 12- Strong acid.
- 13- Weak alkali.
- 14- Strong alkali.
- 15- Metallic oxide.
- 16- Nonmetallic oxide.
- 17- A chemical indicator.
- 18- Acidic gas.
- 19- Basic gas.
- 20- Gas that has a neutral effect on litmus paper.
- 21- White salt.
- 22- Salt soluble in water.
- 23- Salt solution with pH less than 7.
- 24- Scavenger.
- 25- A hereditary trait in humans.
- 26- Harmful mutation in humans.
- 27- Fatal (lethal) mutation in humans.
- 28- Sedimentary rock.
- 29- Metamorphic rock.
- 30- Plutonic igneous rock.
- 31- Surface igneous rock.

- (Oxygen)
- (Bronze alloy)
- (Ammonium NH_4^+)
- (Phosphate PO_4^{3-})
- (Bicarbonate HCO_3^-)
- (Nitric acid HNO_3)
- (Hydrochloric acid HCl)
- (Hydrochloric acid HCl)
- (Sulphurous acid)
- (Sulphuric acid)
- (ammonium hydroxide)
- (Sodium hydroxide)
- (Magnesium oxide)
- (Sulphur trioxide)
- (Litmus paper)
- (Carbon dioxide CO_2)
- (Ammonia gas NH_3)
- (H_2 gas)
- (Zinc sulphate ZnSO_4)
- (Copper sulphate CuSO_4)
- (Ammonium chloride)
- (Hyenas)
- (Eye colour)
- (Spinal deformity)
- (Muscular dystrophy)
- (Limestone)
- (Marble)
- (Granite)
- (Pumice)

10) Give reason for:

- 1- Calcium ($_{20}\text{Ca}$) is a metal, while chlorine ($_{17}\text{Cl}$) is a nonmetal.
 - Because the last energy level of calcium contains 2 electrons, while the last energy level of chlorine contains 7 electrons.
- 2- Graphite (carbon) is used in dry cells despite being nonmetal.
 - Because graphite is the only good electrical conductor nonmetal.

- 3- Aluminum ($_{13}\text{Al}$) is harder and has a higher melting point than sodium ($_{11}\text{Na}$).**
- Because aluminum has more valence electrons (3) than sodium (1), and the strength of metallic bond increases by increasing the number of valence electrons, so the hardness and melting points of metals increase.
- 4- Bronze alloy is used in the manufacture of medals instead of copper.**
- Because bronze alloy is harder than copper, and it doesn't rust.
- 5- Acids turn blue litmus paper into red.**
- Due to the effect of hydrogen cation.
- 6- Alkalis turn red litmus paper into blue.**
- Due to the effect of hydroxide anions.
- 7- Hydrochloric acid is a strong acid, while acetic acid is a weak acid.**
- Because hydrochloric acid is a good electrical conductor, while acetic acid is bad electrical conductor.
- 8- Milk of Magnesia is used to treat stomach acidity.**
- Because it contains magnesium hydroxide $\text{Mg}(\text{OH})_2$ which neutralizes gastric acidity.
- 9- Acid rains have severe harmful impacts on human and the environment in general.**
- Because they cause destruction of forests, corrosion of buildings, and health problems in the human respiratory system.
- 10- Acid rains cause an imbalance in aquatic ecosystems.**
- Because acid rains fall on water bodies harm the living organisms which live in it.
- 11- Litmus paper is not suitable for distinguishing between strong and weak acids.**
- Because it gives the same colour with both of them.
- 12- Distilled water doesn't affect the color of litmus paper (neutral).**
- Because the number of H^+ cations in it equals the number of OH^- anions.

- 13-** The pH meter is more accurate than universal strips in determining the pH value of the solution.
- Because the pH meter displays the pH value directly and immediately on the device's digital screen, while universal strips provide an approximate measuring of the pH values.
- 14-** Oven cleaner is a basic substance, while milk is an acidic substance.
- Because the pH value of the oven cleaner is greater than 7, while the pH value of milk is less than 7.
- 15-** The acidity of grapes is stronger than that of tomatoes.
- Because the pH value of grapes is lower than pH value of tomatoes.
- 16-** The alkalinity of laundry bleach is stronger than that of baking soda.
- Because pH value of bleach is more than pH value of baking soda.
- 17-** It is not possible to drown in the Dead Sea.
- Because the high percentage of salts found in its water leads to increasing the density of this water.
- 18-** A person pushing against a wall does not perform work.
- Because the displacement equals zero.
- 19-** The work done by the car is less than the work done by the truck, even though their speeds are equal.
- Because the mass of the car is less than that of the truck and the kinetic energy increases as the object's mass increases.
- 20-** The kinetic energy of the car decreases when the driver presses the car's brakes.
- Because the car's brakes decreases car's speed and the kinetic energy decreases as the object's speed decreases.
- 21-** Increasing the work required to stop a moving car at a high speed.
- Because the kinetic energy increases as the object's speed increases, so the work done also increases.
- 22-** When a pendulum ball passes through the original position, its kinetic energy is at its maximum.
- Because its speed is at its maximum.

- 23-** The mechanical energy of an object falling from a height is constant despite the decrease in its potential energy.
- Because the amount of decreasing in potential energy equals that of increasing in kinetic energy.
- 24-** Demolition ball is an example of energy conversions.
- Because the potential energy stored in the heavy ball is converted into kinetic energy that is used in demolition.
- 25-** The nutritional relationship between bees and flowers of plant is a mutualistic relationship.
- Because bees benefit by extracting nectar from the flowers while plant benefits from the transfer of its pollen grains on the bodies of the bees.
- 26-** The genes found on a single chromosome are different.
- Due to the difference in the arrangement of the nucleotides that form genes on DNA.
- 27-** DNA is known as a double helix.
- Because it consists of 2 strands twisted around each other.
- 28-** Mendel is considered the founder of genetics.
- Because he concluded from his experiments on pea plants that each hereditary trait is controlled by a pair of genetic factors, which were later known as genes.
- 29-** Genes are responsible for the appearance of hereditary traits.
- Because each gene produces a specific enzyme, which is responsible for occurrence of a chemical reaction that leads to the formation of a protein that expresses a specific hereditary trait.
- 30-** Light skin color in people living in cold regions is a beneficial spontaneous mutation.
- Beneficial mutation because it helps them to absorb vitamin D better.
 - Spontaneous mutation because it occurs naturally without human intervention.

31- Producing cube-shaped watermelons is considered an agricultural technique and not a mutation.

- Because watermelons are placed in square molds during their growth, causing them to take the shape of the mold without any change in their genetic nature.

32- Lactose tolerance is considered a beneficial mutation.

- Because it allows lactose sugar found in milk and dairy products to be converted into simpler sugars that are easier for the body to absorb.

33- Fresh water consumption must be rationalized.

- To ensure its sustainability in the future, as fresh water represents only about 3% of the water available on the Earth's surface.

34- Formation of water drops on the outer surface of a cup containing water and ice cubes.

- Due to the condensation of the water vapour present in air.

35- The boiling point is a characteristic property of pure substance not the evaporation process.

- Because boiling occurs at a certain temperature, while evaporation occurs at any temperature.

36- The sun and gravity maintain the continuity of the water cycle.

➤ Because:

- Heat of the sun causes water to move from the Earth to the atmospheric air through the process of evaporation.
- Earth's gravity causes water to return back to the Earth again through the process of precipitation.

37- Desalination of sea and ocean water.

- To face the shortage of freshwater resources suitable for drinking or irrigation, particularly in remote areas.

38- The freezing of water causes cracks of rocks, leading to their break.

- Because the volume of water increases upon freezing.

39- Thermal expansion and contraction of the minerals that make up rocks.

- Due to the difference in temperature between day and night.

40- Acids and mineral substances are among the causes of chemical weathering.

- Because they cause a change in the chemical structure of rocks.

41- The hot springs of Yellowstone National Park in the United States are a good example of chemical weathering.

- Due to the effect of mineral-rich hot water that causes breaking down of rocks with a change in their chemical structure.

42- Limestone is very important in the treatment of bone fractures.

- Because calcium carbonate powder, resulting from the crushing of limestone rock, is used in making casts for individuals with bone fractures.

43- Erosion process is a double-edged sword.

- Because among the beneficial effects of erosion is the formation of river deltas, while one of the harmful effects of erosion is the coastal erosion.

44- Sedimentary rocks are porous rocks.

- Due to the presence of spaces between the sediment particles that compose them.

45- The crystals of granite can be distinguished by the naked eye, while that of basalt cannot be distinguished by the naked eye.

- Because the crystals of granite are large due to the slow cooling of magma, while the crystals of basalt are small due to the rapid cooling of lava.

11) What are the results of (What happens...)?

1- Knocking on a piece of graphite.

- It will crumble easily.

2- Increasing the number of valence electrons in metal atoms according to the metallic bond.

- The strength of metallic bond increases.

3- Mixing molten copper with molten tin.

- Formation of bronze alloy.

- 4- Combination of positive hydrogen cation with a negative bromide anion.**
 - Formation of hydrobromic acid (HBr).
- 5- The passage of electric current through sulphuric acid (or sodium hydroxide) according to lighting of the lamp.**
 - The lamp will lit.
- 6- The passage of electric current through acetic acid (or ammonium hydroxide) according to lighting of the lamp.**
 - The lamp will switch off.
- 7- Reaction of acids with alkalis.**
 - Formation of salts and water.
- 8- Lactic acid accumulates in the muscles of the human body.**
 - It causes muscle cramps.
- 9- Heating a piece of magnesium then adding water to the previous product then putting red litmus paper to the solution.**
 - Formation of magnesium oxide MgO , which dissolves in water forming magnesium hydroxide solution $\text{Mg}(\text{OH})_2$, that turns red litmus strip to blue.
- 10- Dissolution of sulphur oxide in rainwater.**
 - Formation of acid rain.
- 11- Fossil fuels burn in factories and cars.**
 - Acidic oxides such as nitrogen dioxide NO_2 and sulphur dioxide SO_2 have evolved.
- 12- Putting a piece of sugar in a test tube containing sulphuric acid.**
 - It makes the table sugar to be charred (becomes black).
- 13- Placing wet red and blue litmus paper in a tube of hydrogen gas.**
 - The colour of the indicator doesn't change.
- 14- Placing wet red and blue litmus paper in a tube of chlorine gas.**
 - Chlorine gas removes the colour of the two litmus strips (bleaching).
- 15- Placing litmus strips in a solution whose pH is 11.**
 - The colour of the red strip turns blue.

16- Adding each of nickel chloride salt and silver chloride salt separately to an amount of water with stirring.

- Nickel chloride salt will dissolve in water forming solution, while silver chloride salt doesn't.

17- A moving car covers the same distance it travelled in half the time.
(Regarding its speed)

- The speed increases to double.

18- The force decreases to half and the displacement is doubled.
(Regarding the work done)

- The work done remains constant.

19- The height of the object above the surface of the ground is doubled with constant weight.
(Regarding its potential energy)

- Potential energy increases to double.

20- The speed of a moving object is doubled with constant mass.
(Regarding its kinetic energy)

- Kinetic energy increases to four times its value.

21- The mass of a moving object decreases to half and its speed is doubled.
(Regarding its kinetic energy)

- The kinetic energy increases to double.

22- Lack of food sources in a balanced ecosystem.
(Food shortage for a group of hyenas)

- It leads to increased competition among living organisms (hyenas), which affects the number of individuals in the biotic populations.

23- Decomposers disappear from the ecosystem.

- Dead bodies will accumulate without decomposition so nutrients can't be recycled to the ecosystem.

24- The absence of any living organism from a balanced ecosystem.

- It affects the remaining individuals of the food web, resulting in a disruption of the ecological balance.

25- The increase in the number of primary consumers.

- It leads to a decrease in the number of producers as well as an increase in the number of secondary consumers.

- 26- Difference in the order of nucleotides in a single chromosome.**
- It results in the difference of the genes present on a single chromosome, which in turn leads to the difference in the hereditary trait that each gene is responsible for expressing.
- 27- A person suffering from lactose intolerance eats a piece of milk chocolate.**
- He will feel crampy, nausea and other painful symptoms.
- 28- Placing a cup of water in a sunny place for several hours.**
- The amount of water in cup decreases gradually due to evaporation.
- 29- The cloud temperature is below freezing point.**
- Snow precipitates instead of rain.
- 30- Small ice crystals gather during thunderstorms.**
- Formation of hail.
- 31- The water cycle stops suddenly.**
- The water in water bodies can't be renewed and the amount of water in the hydrosphere will decrease.
- 32- Container filled with water up to its edge and placed in the refrigerator for several hours.**
- It will break due to the increase in the volume of water upon freezing.
- 33- Freezing of water in rock cracks.**
- Mechanical weathering of rocks.
- 34- Adding drops of acid to a piece of limestone.**
- Chemical change occurs in calcium carbonate substance which makes up the limestone, leading to the corrosion of the limestone.
- 35- The exposure of blocks of granite to chemical weathering.**
- Breaking down and fragmenting rock with a change in its chemical structure forming sediments.
- 36- Increasing pressure on rock sediments.**
- Compaction and lithification of sediments into layers forming sedimentary rocks.
- 37- The exposure of sandstone to extreme pressure and heat.**
- Transformation of sandstone into quartzite.

12) Complete the following table:

	Name of compound	Chemical formula	Type
1-	Hydrosulphuric acid	H_2S	Acid.
2-	Sulphurous acid	H_2SO_3	Acid.
3-	Sulphuric acid	H_2SO_4	Acid.
4-	Phosphoric acid	H_3PO_4	Acid.
5-	Hydrogen iodide	HI	Acid.
6-	Carbonic acid.	H_2CO_3	Acid.
7-	Ammonium hydroxide	NH_4OH	Alkali.
8-	Magnesium hydroxide	$\text{Mg}(\text{OH})_2$	Alkali.
9-	Magnesium oxide	MgO	Metal oxide.
10-	Sulphur trioxide	SO_3	nonmetal oxide.
11-	Ammonium sulphate	$(\text{NH}_4)_2\text{SO}_4$	Salt.
12-	Calcium bromide.	CaBr_2	Salt.
13-	Potassium phosphate	K_3PO_4	Salt.
14-	Sodium carbonate	Na_2CO_3	Salt.
15-	Ammonium nitrate	NH_4NO_3	Salt.

13) Problems:

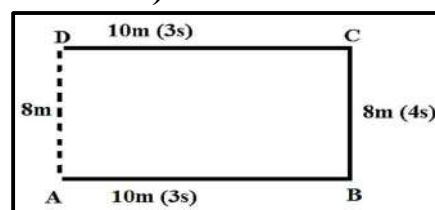
- 1- A body moves (10 meters) east in (3 seconds), then moves (8 meters) north in (4 seconds), then moves (10 meters) west in (3 seconds). Calculate:

Total distance – Displacement – speed.

➤ Total distance = $10 + 8 + 10 = 28 \text{ m}$.

➤ Displacement = $\text{AD} = 8 \text{ m}$.

➤ Speed (v) = $\frac{d}{t} = \frac{28}{10} = 2.8 \text{ m/s}$.



- 2- Calculate the speed of a body that covered a distance of 40 km in two hours.

➤ Speed (v) = $\frac{d}{t} = \frac{40}{2} = 20 \text{ m/s}$.

- 3- Calculate the time required to cover a distance of 3km if the body is moving at a speed of 20 m/s.

➤ Distance = $3 \times 1000 = 3000 \text{ m}$. ▶ $t = \frac{d}{v} = \frac{3000}{20} = 150 \text{ s}$.

- 4- A person pushed an object with a force of 40 Newtons and it moved in a straight line a distance of 10 meters. Calculate the amount of work done.

➤ $W = F \times s = 40 \times 10 = 400 \text{ J.}$

- 5- Calculate the potential energy of a body with a mass of 15 kg at a height of 150 cm. (knowing that the acceleration due to gravity is 10 N/kg)

➤ Height = $150 \div 100 = 1.5\text{m.}$

➤ $PE = m \times g \times h = 15 \times 10 \times 1.5 = 225 \text{ J.}$

- 6- Calculate the weight of a body with a potential energy of 240 J at a height of 12 m.

➤ $w = \frac{PE}{h} = \frac{240}{12} = 20\text{N.}$

- 7- Calculate the height of an object of mass 6 kg above the ground when its potential energy 180 J.

(knowing that the gravitational field intensity is 10 N/kg)

➤ $h = \frac{PE}{m \times g} = \frac{180}{6 \times 10} = 3\text{m.}$

- 8- Calculate the mass of an object with kinetic energy 0.5 kJ moving at a speed of 5 m/s.

➤ Kinetic energy (KE) = $0.5 \times 1000 = 500\text{J.}$

➤ $m = \frac{2KE}{v^2} = \frac{2 \times 500}{5 \times 5} = 40\text{kg.}$

- 9- Calculate the speed of a ball with a mass of 2000 gm and a kinetic energy of 25 J.

➤ $m = 2000 \div 1000 = 2\text{kg.}$

➤ $v^2 = \frac{2KE}{m} = \frac{2 \times 25}{2} = 25.$

➤ $v = \sqrt{25} = 5\text{m/s.}$

- 10- Calculate the kinetic energy of a body weighing 20 N, moving at a speed of 3 m/s. (knowing that the acceleration due to gravity is 10 N/kg)

➤ $m = \frac{w}{g} = \frac{20}{10} = 2 \text{ kg.}$

➤ $KE = \frac{1}{2} mv^2 = \frac{1}{2} \times 2 \times (3)^2 = 9 \text{ J.}$

11- Calculate the kinetic energy of a body with a mass of 500 g that covers a distance of 20 m in 5 s.

➤ $m = 500 \div 1000 = 0.5 \text{ kg.}$

➤ $v = \frac{d}{t} = \frac{20}{5} = 4 \text{ m/s.}$

➤ $KE = \frac{1}{2}mv^2 = \frac{1}{2} \times 0.5 \times (4)^2 = 4 \text{ J.}$

12- Calculate the mechanical energy of a moving object if its kinetic energy is 40J and its potential energy is 30 J.

➤ $ME = KE + PE = 40 + 30 = 70 \text{ J.}$

13- An object its mass is 10 kg is released to fall from a height of 4 m above the ground level. [Given that: Gravitational field intensity = 10 N/kg]

a) Calculate the kinetic energy of the object in the following cases:

1) Just before falling.

2) At the moment it reaches the ground.

b) Calculate the mechanical energy of the object at the midpoint between the falling position and the ground.

➤ The KE of the object just before falling = zero.

➤ The KE of the object as it reaches the ground = PE before falling

➤ $= m \times g \times h = 10 \times 10 \times 4 = 400 \text{ J.}$

➤ The ME of the object at the midpoint = PE before falling = 400 J.

14- An object its mass is 600 g is thrown upwards vertically at a speed of 20 m/s. Calculate:

a) The kinetic energy of the object at the moment of being thrown upwards.

b) The mechanical energy of the object at the maximum height it reaches.

➤ $m = 600 \div 1000 = 0.6 \text{ kg.}$

➤ $KE = \frac{1}{2}mv^2 = \frac{1}{2} \times 0.6 \times (20)^2 = 120 \text{ J.}$

➤ $ME = KE \text{ at the moment of being thrown upwards} = 120 \text{ J.}$

15- Calculate the amount of energy that transfers to the snake that is a tertiary consumer in a food chain, if the amount of energy at the first trophic level is 1000 energy units.

The amount of energy that transfers to:

- 2nd trophic level (1st consumer) = $1000 \div 10 = 100$ energy units.
- 3rd trophic level (2nd consumer) = $100 \div 10 = 10$ energy units.
- 4th trophic level (3rd consumer - snake) = $10 \div 10 = 1$ energy units.

14) State one importance for each of the following:

- 1- Graphite: it is used in dry cells.
- 2- Bronze alloy: it is used in jewelry, medals and statues.
- 3- Stomach acid: it participates in food digestion.
- 4- Lactic acid: provides the muscles with energy during their lack of oxygen.
- 5- Milk of Magnesia (magnesium hydroxide): it is used to treat stomach acidity.
- 6- pH meter device: it determines the pH value of any solution directly and accurately.
- 7- The demolition ball: it is used for demolishing old buildings by the conversion of potential energy into kinetic energy.
- 8- Decomposers in the ecosystem: they break down the organic substances found in dead bodies into simpler substances which mix with the soil and become part of its components.
- 9- Producers in the food chain: they start any food chain as they are the food source for primary consumers.
- 10- Bees in plant reproduction: the bodies of the bees transfer the pollen grains of plant from one flower to another, which promotes the floral reproduction.
- 11- Chromosomes: they are responsible for the transmission of genetic traits from parents to offspring.
- 12- Genes: they are responsible for the appearance of the hereditary traits in the living organisms.
- 13- Water cycle: The water in water bodies is renewed through the continuity of water cycle in nature and preserves the balance of the ecosystem.

14- Wind in the water cycle in nature: it moves the clouds, within which tiny water droplets accumulate together forming larger and heavier drops of water.

15- Living organisms in the water cycle:

- **Plants are source of water vapour through transpiration process.**
- **Sweat which is secreted by human and animals is considered source of water vapour through evaporation process.**

15) Arrange each group according to what is required in the brackets :

1- $_{17}\text{X} - _{11}\text{Y} - _{13}\text{W} - _{12}\text{Z}$. (Descendingly according to hardness)

- **$_{13}\text{W} > _{12}\text{Z} > _{11}\text{Y} > _{17}\text{X}$.**

2- Bacteria– Snake – Insect – Mouse – Plants – Hawk. (Form a food chain)

- **Plants → Insect → Mouse → Snake → Hawk → Bacteria.**

3- Individual – Biocommunity – Biotic population – Ecosystem.

(starting from ecosystem)

- **Ecosystem → Biocommunity → Biotic population → Individual.**

4- Precipitation – Evaporation – Condensation – Surface runoff.

(pathway of water cycle in nature)

- **Evaporation → Condensation → Precipitation → Surface runoff.**

5- Sand – Clay – Silt – Gravel. (Descendingly according to particles size)

- **Gravel > Sand > Silt > Clay.**

16) How to differentiate between:

1- Distilled water and hydrochloric acid.

- **By using litmus strips where:**

- **Distilled water doesn't change the colour of the two litmus strips.**
- **Hydrochloric acid changes the colour of the blue strip into red.**

2- (CO_2 , O_2) gases.

- **By using wet litmus strips where:**

- **O_2 gas doesn't change the colour of the two litmus strips.**
- **CO_2 gas changes the colour of the blue strip into red.**

3- Ammonia gas and nitrogen dioxide gases.

- By using wet litmus strips where:
 - Ammonia gas changes the colour of the red strip into blue.
 - Nitrogen dioxide gas changes the colour of the blue strip into red.

4- Nitric acid and nitrous acids.

- By measuring their pH values using pH meter device, where nitric acid (strong acid) has less pH value than that of nitrous acid (weak acid).
- By electrical conduction where nitric acid (strong acid) is good electrical conductor, while nitrous acid (weak acid) is bad electrical conductor.

5- Ammonium chloride solution and sodium carbonate solution.

- By measuring their pH values using pH meter device, where:
 - Ammonium chloride solution has pH less than 7.
 - Sodium carbonate solution has pH more than 7.

17) When will it be:

1- The displacement of moving object is zero.

- When the object returns to its starting point of movement.

2- Distance equals displacement.

- When the object moves in straight path in a constant direction.

3- The speed is zero.

- When the object is at rest (the distance is equal to zero).

4- Speed equals distance.

- When the object covers a distance in time of 1 second.

5- The work is equal to zero.

- When the object is at rest (the displacement is equal to zero).
- When the direction of the applied force is perpendicular to the direction of motion.

6- Potential energy equals zero.

- When the object is on the ground (the height of the object equals zero).

7- Kinetic energy equals zero.

➤ When the object is at rest (the speed is equal to zero).

8- Kinetic energy numerically equals twice the mass of the body.

➤ When the speed numerically equals 2.

18) State the number which indicates each of the following:

- 1- The percentage of copper in bronze alloy. (95 %)**
- 2- The percentage of tin in bronze alloy. (5 %)**
- 3- The number of elements in carbonate group. (2)**
- 4- The number of hydrogen cations that combine with one phosphate group to form phosphoric acid. (3)**
- 5- The percentage of energy transferred when moving from any trophic level to the next level in the energy pyramid. (10 %)**
- 6- The percentage of water in the human body. (70 %)**
- 7- The percentage of water in Earth's composition. (71 %)**
- 8- The percentage of land in the Earth's composition. (29 %)**
- 9- The percentage of fresh water compared to the percentage of water on Earth's surface. (3%)**
- 10- The percentage of salt water compared to the percentage of water on Earth's surface. (97 %)**
- 11- The percentage of methane gas in the natural gas composition. (more than 90 %)**

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6